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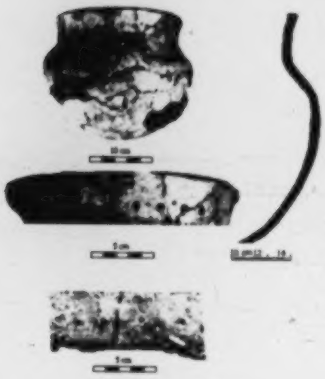

Vessel 29

Vessel 1

Vessel 9

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by

Terrance H. Gibson

THE UNIVERSITY OF ALBERTA

Site Structure and Ceramic Behaviour of a Protohistoric Cree Aggregation Campsite

by

Terrance H. Gibson ©

A Thesis Submitted to the Faculty of Graduate Studies and
Research in Partial Fulfilment of the Requirments for the
Degree of Doctor of Philosphy

DEPARTMENT OF ANTHROPOLOGY

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University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *Site Structure and Ceramic Behaviour of a Protohistoric Cree Aggregation Campsite* by Terrance H. Gibson in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Dr. Raymond Le Blanc, Supervisor
Department of Anthropology

Ruth Gruhn
Dr. Ruth Gruhn
Department of Anthropology

Dr. Owen Beattie
Department of Anthropology

Dr. David Lubell
Department of Anthropology

Dr. Brian Kooyman
Department of Archaeology
University of Calgary

Dr. Richard Morlan
Canadian Museum of Civilization

9 Jan. 1998
Date

ABSTRACT

This study is concerned with the use of pottery by late precontact Cree people occupying Bushfield West, a site located on the Saskatchewan River in east-central Saskatchewan. The pottery is an important hallmark of the Selkirk Composite, whose archaeological sites have been studied in western Canada for over 40 years. Most Selkirk-related research has dealt with the pottery from a stylistic, cultural-historical perspective, relying on the use of pottery from sites that are usually small and poorly preserved. There has never been an opportunity for archaeologists to determine the actual range of stylistic variability within a single Selkirk component, nor has there been any attempt to understand how and where pottery was used on a site, nor whom used it.

The Bushfield West archaeological component revealed intact, distinct artifact clusters resting on a contiguous occupation surface. Many of the clusters yielded pottery sherds of sufficient integrity to enable reconstruction of 98 pottery vessels, 49 from *in situ* contexts. The finely preserved archaeological site, with its rich ceramic assemblage, presented an opportunity to explore the relationship between pottery use and Selkirk Composite site occupation.

Large scale examination of the site's discrete occupation using specially devised material clustering analysis methods enabled the artifact clusters to be individually defined and intensively examined to determine the kinds of activities that took place. Interpreted activities were linked to activity complexes which were hypothesized to have been the physical remains of shelters (residences) or outdoor workshops occupied in the late spring of the year. The interpreted activities that took place within each of these shelters and workshops suggested that most were devoted to general domestic tasks usually involving subsistence, but that a few appeared to reflect ceremonial behaviour. Interpretation of the tasks carried out in each area suggested that some residences/workshops were occupied and/or used principally by men, some by women and a few by mixed gender. Various kinds of evidence indicated that most of the residences were occupied synchronically, suggesting that the occupation was representative of a seasonal band aggregation.

The Bushfield West vessel assemblage was stylistically homogeneous. As a consequence, the pottery was analyzed in a non-traditional way in order to discern patterns of vessel construction, form and use, primarily from the perspective of a tool class, rather than as artifacts bearing information about style. Detailed qualitative and quantitative treatment of the collection indicated that significant variation occurred within characteristics which could have been affected through vessel use, determined principally through examination of the residue found adhering to a vessel's paste. Using vessel use criteria, four classes of pots were identified in the Bushfield West assemblage: heavy cooking, light cooking, boiling and utility. There was evidence that the shape of a vessel may have varied slightly with its function.

Vessel uses appeared to correlate with specific behaviours interpreted to have taken place in the various activity complexes on the site. Heavy and light cooking vessels were found in areas where activities associated with women were identified. Utility and boiling vessels were found in special areas where male behaviour was identified. Based on site data, it appeared that men preferred to use pottery for specific functions such as wet and dry storage, and for making hot beverages. Women used pottery for cooking and specialized bone marrow rendering. In areas interpreted to have been commensal residences, both cooking, boiling and utility vessels were recovered. It appears possible to obtain more detailed interpretations about past human activities and social behaviours from the remains of Selkirk components, especially if careful consideration is made of the context of each component's remains, and how the artifacts from them were used.

Based on the pottery remains from Bushfield West, stylistic variability of pottery associated with a single Selkirk band appears to be minimal. This has important implications for the identification of discrete complexes within the Selkirk Composite. As a consequence, the Bushfield West cultural remains, formerly considered part of the Pehonan Complex, appear to be representative of a newly identified Selkirk complex named Keskatchewan.

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Finally I must express my gratitude for the moral support given to me over the years by my brothers Kim and Owen, my mother Margaret, my wife Jane and son Patrick. This work is dedicated to my late father Harry Hilliman Gibson, who always wanted to do something like this.

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Chapter 1

CERAMICS, SITE STRUCTURE, AND THE SELKIRK COMPOSITE

INTRODUCTION

This study is concerned with the use of pottery by late pre-European contact Cree people occupying a site on the bank of a river in east-central Saskatchewan. As will be explained, the focus on pottery of the pre-contact Cree (whose collective cultural remains are referred to as the Selkirk Composite in Western Canada) is nothing new; Selkirk pottery is virtually the exclusive hallmark of these people and it has been heavily studied for over 40 years. All of these studies have dealt with the pottery from a stylistic, cultural-historical perspective. The quality of the stylistic analysis has been quite variable, primarily because the pottery has been recovered from a northern forest environment, which means that the sites are usually small and poorly preserved, often yielding mixed artifact assemblages. The result is that archaeologists have no firm idea about the ceramic stylistic variability that can be found within a single-component Selkirk site.

In the last 15 years, there has been a growing awareness that pottery served a function in the life of those who made use of it. Archaeologists have become aware that if they want to recreate the livestyles of pottery users from their discarded or lost vessel remains, they have to gain some understanding about how the pots were actually used on archaeological sites. Up until the present time, there has been no attempt to apply functional studies to Selkirk ceramics, again because the archaeological associations of most of the pottery have been less than ideal and assemblage sizes have been very small.

Nevertheless, archaeologists need a more thorough understanding of the potential ceramic stylistic variability within a single Selkirk component, and they need furthermore to understand better how pots were used within that component. Until the present time there has been no opportunity test ceramic variability within a single component, and there has been no attempt to build a theoretical model of pottery use which could be used to tie together the disparate, widely distributed Selkirk assemblages in Western Canada.

This changed with the discovery of a Selkirk site called Bushfield West, which exhibited many of the characteristics which the preceding research objectives demanded. Before addressing the unique charater of this site, and its import to Selkirk studies, an in-depth discussion of the Selkirk Composite will be presented.

CURRENT INTERPRETIVE APPROACHES FOR SELKIRK COMPONENTS

Identification of Selkirk Composite components and assemblages (cf., Syms 1977:70) is based almost exclusively on the presence and stylistic variation of Selkirk pottery (Meyer and Russell 1987: 4). Spatial separation of Selkirk ceramic variants has consequently been used to devise hypothetical regional distributions of Selkirk populations. These population divisions are referred to as "complexes," of which at least five are now recognized (ibid: 4, 5). Using arguments of ethnographic analogy and chronology, archaeologists have argued that the hypothetical complexes represent distinct groups of ancestral Cree, essentially living in discrete "territories" mostly in the forested regions of Western Canada.

In essence, following the tenents of this argument, if Selkirk pottery from northern Manitoba is significantly different in form and decoration from pottery found in southeastern Manitoba, then it is permissable to define a separate Selkirk complex (Smith 1981; Meyer and Russell 1987). Being largely restricted to ceramics to interpret the archaeological record, one must assume that regional ceramic variability can be equated to the existence of regionally distinctive groups of people. This working premise inevitably becomes less workable as the space between the complexes diminishes. The main problem is that stylistic differences separating Selkirk wares are usually subtle, and not infrequently grade into one another. When the complexes begin to overlap archaeologically, stylistic definition becomes problematic. As a consequence, archaeologists must wrestle with apparent "multi-assemblage" Selkirk components that have ceramic attributes of several complexes. Does the mixing entail occupation by distinct ceramic-bearing bands at different time periods, at the same time, or does the combination of ceramic traits indicate a hybridization of styles within a single group, as the result of borrowing or even exchange of personnel within the band?

In fact, archaeologists appear to be unsure of the breadth of ceramic stylistic variation attributable to a single Selkirk complex. As Binford (1983:65) has noted, "although a culture might be relatively stable and unchanging, the archaeological record generated by such a system might well be variable and differentiated". No study of a Selkirk Composite component has attempted to address this problem with reference to ceramics. In essence, insufficient attention has been placed on the potential variability which can be expected in a complete Selkirk ceramic assemblage when archaeological sites are assigned Selkirk complex affiliation. Consequently, archaeologists may be unable to distinguish inter-cultural variability from intra-cultural variability when addressing Selkirk archaeological materials.

This fundamental weakness is underscored by the absence of archaeological models available to reconstruct prehistoric relationships between identified Selkirk complexes. With the exception of the Pehonan complex, which has been postulated to be in contact with as yet unidentified Plains complexes (Meyer 1981, 1984; Meyer and Russell 1987), most Selkirk complexes are too poorly defined to be placed into a larger theoretical framework which could explain their relationships. Certainly, a concept such as the co-influence model (Syms 1977, 1980), which has been applied to the grasslands and forest/grassland transition zones of North Dakota, Minnesota, and Manitoba (ibid.; Michlovic 1983; Nicholson 1987) could not be used for Selkirk because the complexes, as now understood, are essentially static areas maintained by Cree groups. If a group moves outside of its defined core area (which they will, according to the co-influence model {Syms 1977:5-8}) their new archaeological record could be recognized as a new complex and therefore the people would be defined as a newly identified group.

Just what is the ceramic variability expressed within a single ancestral Cree group? Unfortunately, the lack of ceramic continuity between the pre-European contact and post-contact period underlies our poor knowledge of pottery stylistic variation in the Selkirk Composite. It is only with the greatest difficulty that archaeological data representing Selkirk can be integrated with known Cree ethnohistorical and ethnographical data. Historic Cree data demonstrate the diversity and richness of the non-material culture, yet those aspects of material culture that most frequently survive in the Selkirk archaeological record, stone and ceramic industries, are not manifested in existing societies, and apparently ceased to be part of the Cree culture very quickly after contact with Europeans. Consequently, current material culture analyses that are derived from ethnoarchaeological study of contemporary boreal forest people are of limited use for the study of Selkirk remains.

THE ARCHAEOLOGICAL REMAINS AT BUSHFIELD WEST

In the early 1960s, while excavating the Francois-Finlay fur trade post, staff of the Saskatchewan Museum of Natural history conducted a surface examination of the land surrounding the site. There had been no previous professional archaeological survey of this region, which was located on the upper waters of the Saskatchewan River near the town of Nipawin, Saskatchewan (Figure 1.1). To the north of the fur post, they discovered a surface scatter of lithics and bone on a cultivated field. The remains were recorded as part of archaeological site FhNa-10 (Figure 1.2, 1.3), but were otherwise unreported. The site received no other professional interest until 1976, when it was re-examined during an impact assessment of the "Axis 4" power dam development being proposed by the Saskatchewan Power Corporation. The artifact scatter, upon re-examination, appeared to be more extensive than originally reported, possibly as a consequence of surface erosion (Meyer 1977, 1982). Artifacts were collected, including a projectile point and several pottery fragments, which appeared to associate the site to the late prehistoric Clearwater Lake complex (ibid. 1977).

Construction of the Axis 4 development, renamed the Francois-Finlay dam project, was initiated in 1981. The Saskatchewan Research Council was commissioned to undertake an archaeological mitigation program to assess and mitigate potential impacts to cultural resources affected by the dam construction and eventual filling (Burley et al. 1982:iii). FhNa-10, renamed Bushfield West, was intensively assessed, revealing an intact archaeological occupation beneath the plough zone. Test excavations revealed that archaeological remains rested on a thin paleosol buried approximately 15 cm below the ground surface (Prentice 1982:255-257). The test results indicated that further excavations were warranted.

Between 1982 and 1984, under field direction of the author, intensive site assessment and excavation commenced. The assessment program consisted of large scale grid-oriented shovel testing, instituted to determine the limit of site extent, integrity and cul-

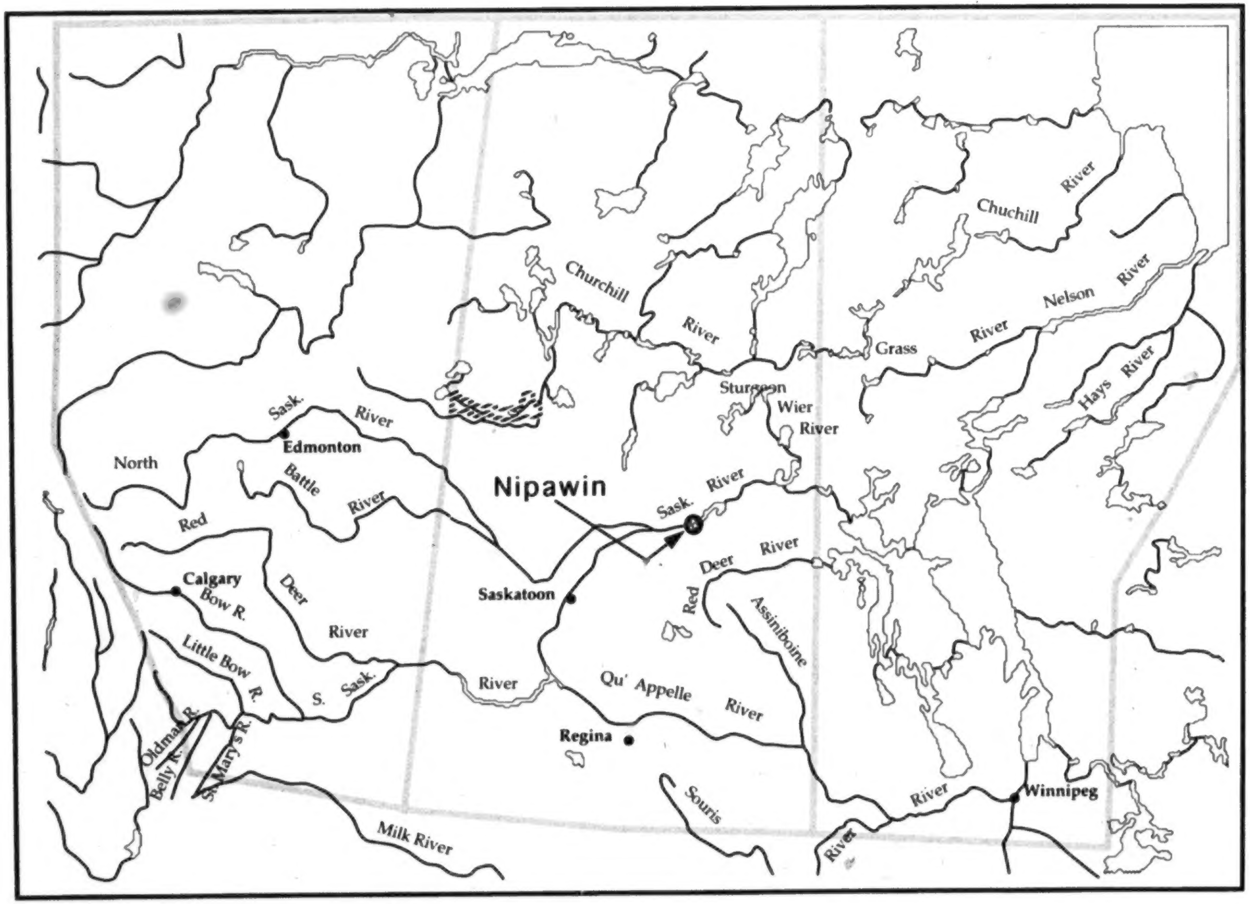


Figure 1.1. Location of the Nipawin Reservoir Heritage Study Project.

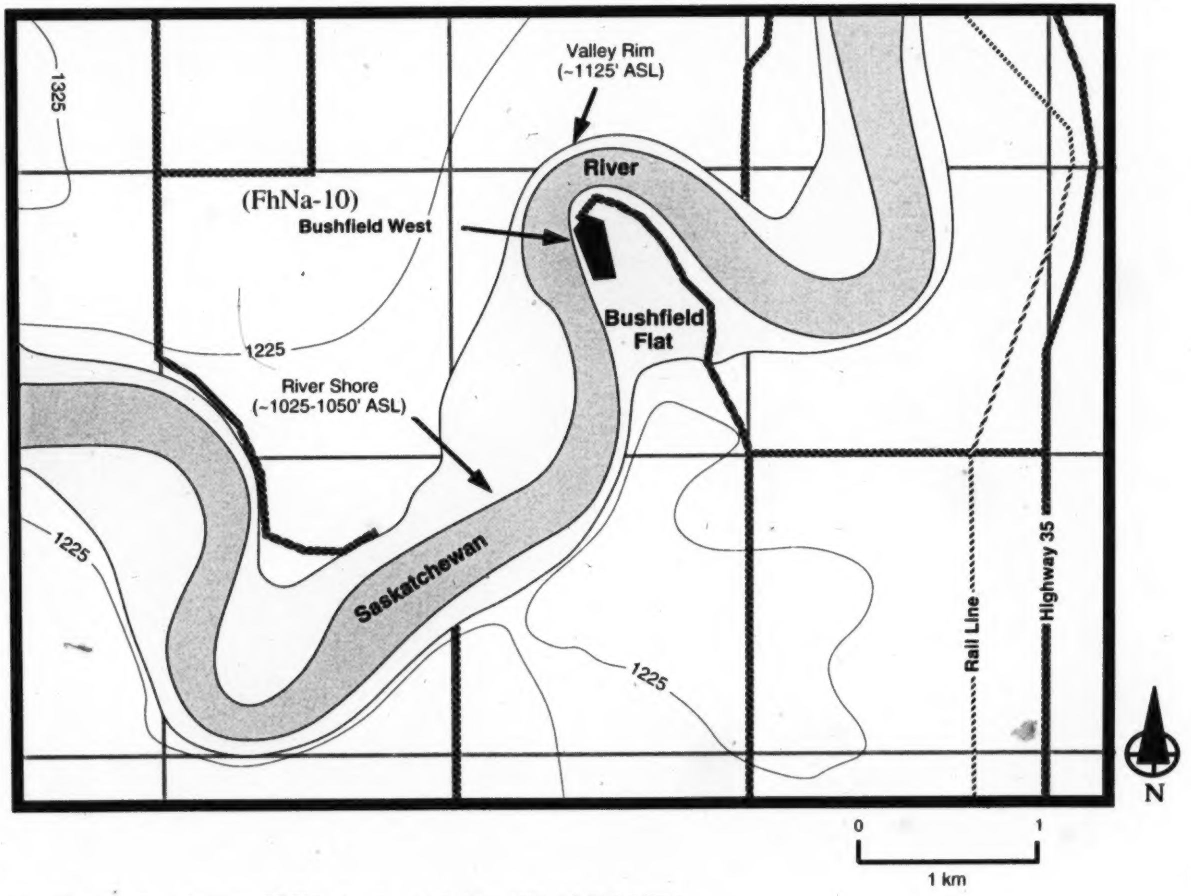


Figure 1.2. The Saskatchewan Valley in the vicinity of Bushfield Flat.

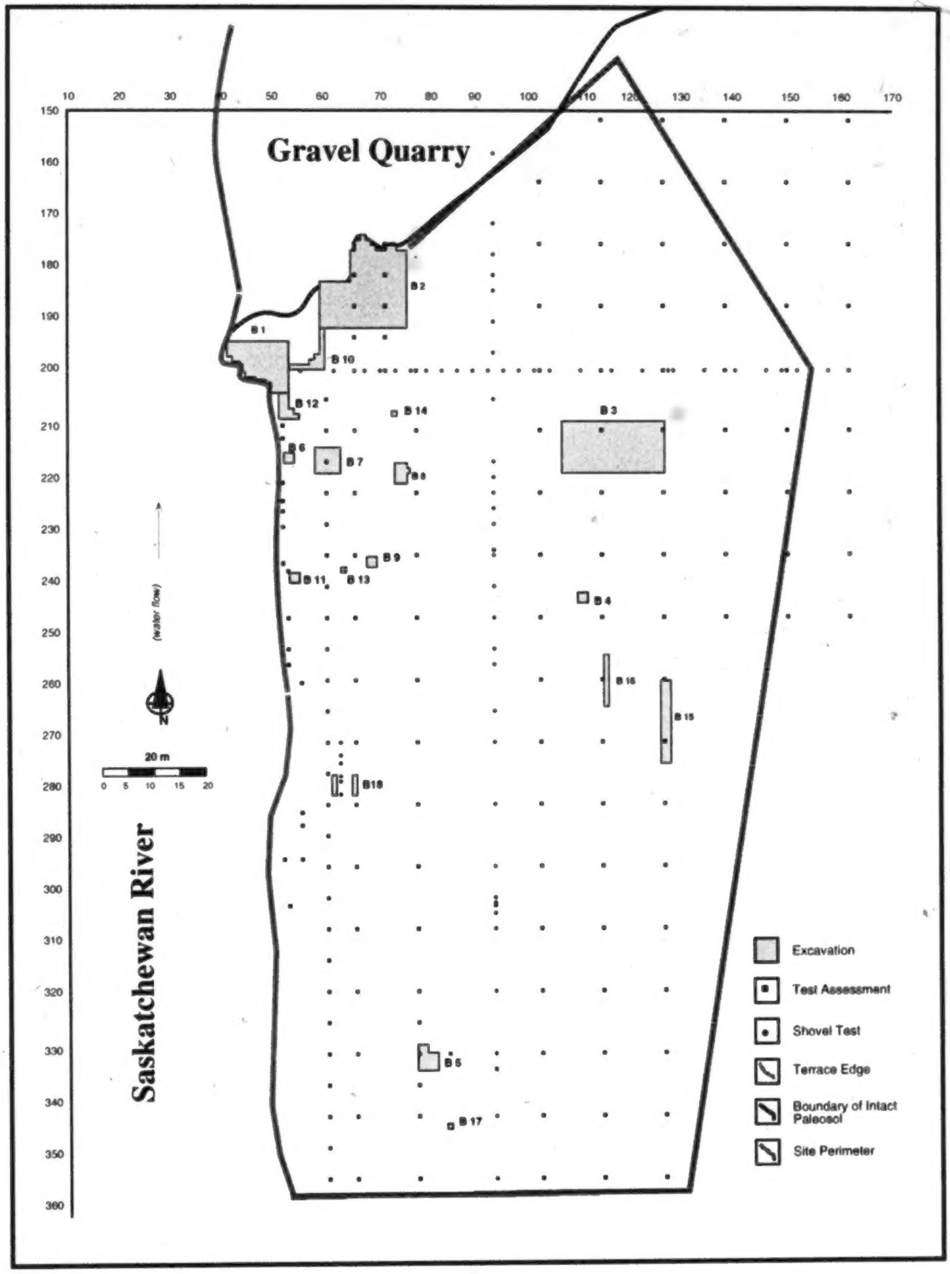


Figure 1.3. BushfieldWest (FhNa-10), showing perimeter and areas excavated from 1981 to 1984.

tural content (Gibson 1983a). In areas where undisturbed high density recoveries were made, magnetic assessment techniques were used to locate buried features (ibid. 1983a, 1986c). Excavation entailed large scale exposure of the site's archaeological component in order to secure statistically significant collections of archaeological materials from separate areas of the site (Gibson 1983a:7). At the completion of excavations in 1984, 625 square metres of occupation surface had been exposed and recorded. Approximately 250,000 artifacts were collected. The most interesting artifact class was pottery, of which nearly 10,000 sherds were recovered from disturbed and undisturbed contexts. All but a few sherds bore resemblance to pottery associated with the Selkirk Composite (Meyer and Russell 1987).

The occupation surface appeared largely undisturbed and very well preserved. In a number of areas cultural remains were found in discrete clusters, often surrounding hearth remains. Remarkably, many of these hearths and associated artifact clusters appeared to be self-contained, surrounded completely by sterile occupation paleosol. The lack of blurring in these areas suggested that the remains represented short duration occupation events, possibly occuring during a single season or less.

From a cultural-historical perspective, the data from Bushfield West, though rich and varied, said nothing new about the Selkirk Composite. No new vessel forms were identified; in fact, the pottery looked very much like pottery from other sites on the Saskatchewan River all the way to the Manitoba border and beyond. No hitherto unrecognizable activity behaviours were identified anywhere on the site. Though many kinds of activities were represented, every one of them was replicated on other Selkirk sites excavated in the immediate locality and for the most part were represented on many other Selkirk sites throughout parts of Northwestern Ontario, Manitoba and Saskatchewan. At the "standard" descriptive level, the site appeared to represent simply more of what was already known of the Selkirk Composite.

The unusual aspect of Bushfield West was its archaeological component, which was well-preserved and rested on an accurately defined occupation surface (Figure 1.4). On most Selkirk archaeological sites, artifacts are found in "zones" of occupation, often defined in arbitrary levels of five cm or more. Artifacts contained within these zones are assumed to be part of a cultural horizon, but whether this horizon represents occupation by a single group of people over a short time, or re-occupation a number of times by the same people or subsequent occupation by an entirely different group of people is usually a much-debated point among archaeologists. Excavation of the Bushfield West archaeological component, on the other hand, produced strong evidence that individual occupational events could be isolated and identified on the site. The stratigraphic integrity of the archaeological deposit and the apparent horizontal separation of clustered archaeological remains (Figure 1.5) indicated that many past activities had not overlapped spatially, and were in fact reasonably discrete. Individual and small group activities could be isolated by examining Bushfield West's archaeological component in detail, using intrasite-

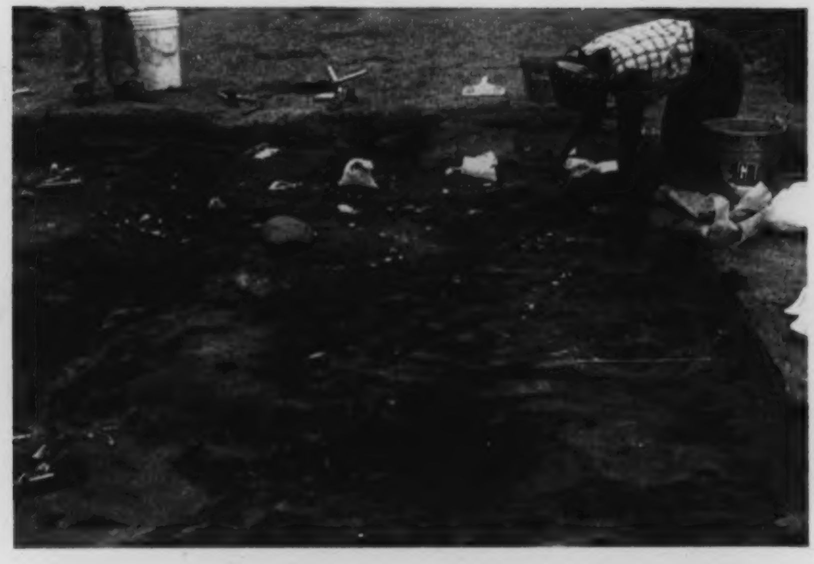


Figure 1.4. Sweeping exposed living surface in an excavated area of Bushfield West.

Figure 1.5. Remains of several pottery vessels found smashed in place on Bushfield West

oriented analytical procedures.

THE RESEARCH PROPOSAL

For any site, intrasite analysis of an asynchronous archaeological component yielding a large number of reconstructable pottery vessels provides an ideal situation for evaluating ceramic stylistic variability. If, as will be demonstrated, Bushfield West's archaeological component reflects these conditions, stylistic variability and vessel function within the pottery assemblage should be a reflection of the range of pottery styles and functions observed in the pottery of a typical ancestral Cree group. Presumably, many different kinds of activities would be documented in the intrasite analysis. If pot remains were recovered in those activity areas, pot style and function should theoretically correspond with the interpreted behaviours of those areas.

Uniting a well-represented pottery assemblage with a well-understood site structure presents a means of addressing many theoretical problems which hamper the understanding of the Selkirk Composite. Through study of the distribution and use of Bushfield West ceramics within the context of Bushfield West campsite behaviour, the foundation of Selkirk studies, that is, the use of ceramics as a means of identifying and characterizing Selkirk archaeological components, will be examined.

This kind of analysis requires a rigourous analysis of Bushfield West's archaeological component, and a comprehensive analysis of the stylistic and functional variability found within the component's ceramic assemblage. In fact, three separate studies were required:

1) Intrasite Analysis

The relationships between people and space from an archaeological perspective have received increasing emphasis during the past three decades (for examples see Carr 1984, 1989; Grøn 1987, 1995; Hietala 1987; Kent 1984, 1987). This perspective is reflected by the growing number of studies that seek to reconstruct past human behaviour, principally by investigating the spatial organization of remains left on archaeological sites. Early attempts in this regard raised great expectations that such an orientation would enhance explanation of the archaeological record, illuminating social behaviours and relationships thought unattainable through the study of material culture (e.g., Deetz 1965; Hill 1966, 1970; Longacre 1964, 1968, 1970). This pioneering work was subsequently critically evaluated and found wanting. The primary objections raised were not of the study goals, nor even the methodology; rather, critics discounted the studies' founding assumptions, questioning their reliability and dismissing their applicability to the interpretation of material culture (Allen and Richardson 1971; Baldwin 1975; Stanislawski 1973).

Subsequent spatial studies adopted the goals of these early studies, but placed much more emphasis on developing methodology and explicating research assumptions. In an attempt to generate models of site formation, archaeologists began considering the effect of depositional processes on archaeological interpretation in order to differentiate "cultural" from "natural" archaeological accumulation on sites (Binford 1982; Schiffer 1972, 1976). Many initiated detailed studies of existing ethnic groups, studying their material culture and the process of its relegation to the archaeological record, determining how this transferral was modulated by group social organization and operation. This type of archaeological research, referred to as "living archaeology" or more commonly as "ethnoarchaeology" was conducted throughout the world on a variety of social systems (Binford 1978a, 1978b; Gould 1978; Hanks and Winter 1983, 1986; Janes 1983; Kent 1984; Kramer 1979; Yellen 1977). There was also some attempt to duplicate the results of past human activity in space through experiment. Some studies went well beyond replication and imitation of behaviour to tests of method and technique and the theoretical principles relating to them (Ingersoll et al. 1977:xii).

Despite the plethora of methodological approaches now in use by most archaeologists, and their commitment to explaining behavioural variation as manifested in the archaeological record, there has been only modest success in using that record to understand the social dynamic of the past (Binford 1977; Meltzer 1979; Moore and Keene 1983). One of the more crucial reasons for the disappointing show is that variability of the archaeological record is recognized to be much greater than originally believed (Moore and Keene 1983:4). This situation meant that even the simplest interpretations made by many studies were largely inapplicable to other prehistoric components, which severely limited comparisons except at very general levels. Isolation and identification of site behaviours was seen as only part of the task of interpreting the archaeological record. The greater task was to develop operational "rules of thumb" or middle range theory (Binford 1977) so that the organizational framework within which behaviour was executed could also be documented (Binford 1987:452) and used as the basis for comparison.

One cogent explanation for the inability of archaeologists to explain variability between sites was that their research was focussed at higher levels of comparison. Sophisticated comparative methodologies have usually addressed site behaviour from a broad, modal, social perspective, through concepts such as ethnicity, kinship, residence and political organization. As Brooks (1982:67) points out, archaeologists have failed to consider the distinctions between individual, small group and community level activities, particularly as these activities pertain to site structure analysis. Most archaeological remains are the product of individual or team actions, through individual events and team multiple-events or episodes (ibid:68). The events and episodes constitute the elements which archaeologists must discern (Brooks 1982), fit into an organizational framework (Binford 1987) and compare. These data can be secured from well-structured events such as houses, burials and refuse areas (Brooks 1982:68,69), or, as others have suggested, small sites (Pokotylo 1982).

In many ways the conditions exemplified at Bushfield West are ideal for this type of interpretive approach. Although the site is large, it is readily broken into small analytical units or "components" consisting of features and surrounding artifact clusters. The components appear to be well-structured (most were the product of residential behaviour) and each component considered individually may be analogous to a small site. Excellent preservation and apparent minimal inter-component mixing suggests that each component can be examined from the point of view of the individual and the small group.

Examining each component from this point of view required the definition of models of site use to compare activities and deduce behaviours taking place on Bushfield West. Development of site use models in turn is critically dependent upon the interpretation of the artifact assemblages recovered from the site, in particular how those assemblages are formed on the occupation surface.

Behavioural modeling of hunting and gathering site activities has not been extensively undertaken. The most frequently cited example is Binford's "Drop/Toss Zone" model (1978a, 1983), which was based on an ethnoarchaeological study of the Nunamiut Eskimo of north central Alaska. Certain elements of this model were adapted by Stevenson (1982, 1986, 1991) for application to living floor interpretations analogous to those found at Bushfield West. These models particularly addressed site formation from the perspective of tool manufacturing, for which there was ample evidence at Bushfield West. Neither considered pottery assemblage formation, which is of particular concern for this study.

Certainly, devising some form of site formation model to explain the anomalous clustering on Bushfield West was desirable. Unfortunately, analogues on which to begin to construct the model were not easily applied. All evidence suggested that the site was of anscestral Cree origin, which argued that a fairly specific behavioural model was needed to order and compare the remains reliably. This model would have to account for episodes of stone and bone tool manufacturing, clothing manufacturing, food preparation and consumption, and ceremonial activity. Based on archaeological recoveries, it was apparent that these activities often took place within one area, usually in proximity to one or several fire hearths. Complicating this situation was the observation that certain remains (particularly lithic debitage) were extremely numerous, and could not be feasibly examined on an individual basis. Often multiple classes of remains of widely varying frequencies co-occupied a single provenience unit, making it difficult to determine the relative significance of any particular item.

A basic strategy to address these conditions was formulated in a systematic, procedural manner. The strategy entailed: (1) Development of a site formation model tailored to the conditions observed at Bushfield West; (2) isolation of discrete artifact cluster areas, since these were inferred to be the loci of significant human behaviour; (3) characterization of the activities that produced the clusters by descriptive and statistical means; (4) classification of the activities according to deduced behaviour using the site formation model, and (5) grouping of the deduced behavioural units into a social model. Using the hypothetical cluster constellations described above, one would (1) isolate artifact clusters within the activity constellations using a method of cluster analysis (2) determine the activity or activities responsible for the cluster (tool making, cooking, bone processing), (3) determine what behaviours are represented (manufacturing, subsistence, ceremony), and (4) produce a social representation of the behaviours (male-oriented ceremonial activities, nuclear family residence, etc.).

Excavation of the Bushfield West archaeological component produced overwhelming evidence that individual events could be isolated and identified on the site. The stratigraphic integrity of the archaeological deposit and the apparent horizontal separation of clustered archaeological remains indicated that many past activities had not overlapped spatially, and were in fact reasonably discrete. Isolation of individual and small group behaviours could be effected by examining Bushfield West's archaeological component in detail, using intrasite-oriented analytical procedures.

A single occupation of this extent and preservation has seldom been available for detailed archaeological analysis, certainly not one apparently related to a well-defined, geographically wide-spread archaeological manifestation such as the Selkirk Composite. Although a detailed description of the intra-site behaviour taking place on Bushfield West would be a significant contribution to the understanding of Selkirk site dynamics, certain aspects of the assemblage suggested that more than campsite lifeways could be secured from pursuing an intra-site research perspective.

2) Ceramic Stylistic Analysis

Since intra-complex ceramic variability is a primary focus of this study, ceramic analysis will be emphasized. As has been suggested, pottery variability has been at the centre of Selkirk studies up to the present time; in fact, the artifact class has been used as the basis for defining Selkirk complexes, and is the primary artifact used to associate archaeological components within the Selkirk Composite. As will be established below, pottery comparisons have been largely based upon stylistic analysis. The ware is stylistically simple; styles defining complexes possess specific traits which become key indicators of a ware type. Style becomes the chief means of associating sites through time, or through space. This is a common methodological approach in the analysis of ceramics on archaeological sites (Plog 1980:1). An alternative means of comparing sites is through ceramic materials analysis, as proposed by Hanna (1983). Both of these analytical approaches have already been used to summarize some ceramic data from Bushfield West (Gibson 1984, 1986b; Malainey 1985; Meyer 1981, 1984; Meyer and Russell 1987).

As will be shown, stylistic variation among Bushfield West's many vessels was not significant. Athough relatively complete vessels were well-represented, few exhibited significantly different decorative motifs. Malainey (1985) conducted a feasibility study of vessel material analysis on one Bushfield West vessel to determine if detailed mineralogical analyses could be applied to the ceramic assemblage. Her results indicated that such an approach would be feasible, but she did not pursue study of the entire Bushfield assemblage. As part of her on-going research Tisdale (1987) analyzed sherds from 20 vessels from Bushfield West. The results of her research have not yet been released.

3) Ceramic Functional Analysis

The third study also involves examination of the ceramic assemblage, but from a functional rather than stylistic perspective. As an alternative to style and materials analysis, the pottery from Bushfield West will be considered in terms of functional differentiation. Most pots recovered from Bushfield West were probably utensils to be used, rather than objects of decoration or art. On Bushfield West all evidence suggests that pots were used as containers. However, there are indications that certain types of vessels may have been used in different situations by different personnel. This possibility suggests that specific types of vessels may be used to infer behavioural characteristics if vessel function is assessed in relation to its deduced activity. For example, a pot may have been used to cook food, or it may be used to hold liquefied paint. The function may be indicative of a specific social behaviour taking place on the site.

The adoption of this approach to vessel analysis is concordant with the site structure analysis undertaken on Bushfield West. Within this study, the Bushfield West ceramics will be treated as a collection of variable-purpose containers that served different functions (Braun 1983, Skibo 1992). Vessels will be correlated between areas of the site in terms of their relationship to overall site behaviour rather than as media bearing messages of style (Sackett 1986:269; Weissner 1983; Wobst 1977). This methodological strategy has significant import for all Selkirk archaeological studies, which, as will be shown, are very dependent upon ceramics for most archaeological interpretations.

SUMMARY

Bushfield West yielded an unusually complete ceramic assemblage. Most *in situ* pottery recoveries were discovered in clustered association with other sherds, rather than as isolated specimens. The clusters often represented portions of a single vessel, which greatly simplified vessel reconstruction. Crossmending of isolated sherds and sherd clusters enabled 98 vessels to be identified, 49 from *in situ* contexts. More than half of the vessel reconstructions include the rim, neck and shoulder, permitting vessel forms to be accurately depicted.

The ceramic assemblage was part of a rich archaeological component representing a possibly asynchronous human occupation. Individual vessels were found associated with clustered artifacts and features which would be expected to be found on a typical hunting and gathering band campsite. As will be shown, certain aspects of the ceramic assemblage, particuarly vessel function, can be correlated not only with the activities which were interpreted to have taken place on Bushfield West, but also with certain aspects of the social structure exhibited by the site's inhabitants.

The finely preserved archaeological site, with its rich ceramic assemblage, presents a rare opportunity to explore the relationship between pottery use and Selkirk Composite

site occupation. As will be shown, such a relationship extends beyond co-functional associations of vessel classes with subsistence activities, and can in fact be correlated with certain kinds of social organization, including gender-specific pottery use.

To conclude this introduction, a general description of how this study is organized is probably in order. Chapter 2 summarizes the historical development of the current concept of the Selkirk Composite, and also provides some insight into the ethnohistorical background of the western Cree, who are believed to have been direct descendents of the people responsible for Selkirk achaeological remains. Chapter 3 describes the geographical context of Bushfield West, especially site formation processes and dating. Chapter 4 describes the methods used to excavate the site, and to process and catalogue the artifacts. The analytical framework of the non-ceramic artifact analysis is explained, as is the method used to identify activity areas on the site statistically. Chapter 5 describes the *in situ* recoveries from the site, by excavation block and activity area. Although somewhat detailed, it lays the foundation for developing general and site-specific settlement models and activity area interpretations, which are extensively examined in Chapter 6.

Chapter 7 digresses from the discussion of Bushfield West's site remains by describing in detail the ceramics recovered from Bushfield West, and the methods used to undertake a comparative analysis of the vessels. Chapter 8 describes the results of the ceramic analysis, and develops models and hypotheses about pottery use on Bushfield West.

Chapter 9 fuses the theoretical site settlement models and hypotheses of Chapter 6 and the pottery use models and hypotheses of Chapter 8, providing an in-depth reconstruction of the activities of the people who occupied Bushfield West, and their selective use of pottery on the site. Chapter 10 concludes this study, assessing the relevance of ceramics as a means of interpreting behaviour on archaeologial sites with pottery. The site behaviour and ceramic analysis approach is compared to those approaches used in past and current studies of Selkirk archaeological sites, and some recommendations are made for future Selkirk archaeological work.

CHAPTER 2

OVERVIEW OF THE SELKIRK COMPOSITE

HISTORICAL DEVELOPMENT OF THE CONCEPT OF THE SELKIRK COMPOSITE

Archaeological work on late precontact sites in Western Canada began with the work of R.S. MacNeish, of the National Museums of Canada. In 1951, 1952 and 1953 he excavated eight sites in southeastern Manitoba, eventually defining a number of archaeological units or "foci" through which he was able to bring some order to the archaeological recoveries. One of these units dated to the "terminal late prehistoric" period, which he named "Selkirk" (MacNeish 1958:67-71). The Selkirk focus was characterized by small side-notched and triangular projectile points, and by globular pottery vessels with constricted necks and normally outflaring rims. The pottery proved to be the most diagnostic artifact class and was initially called "Winnipeg Fabric-impressed Ware," because its most distinctive feature was a smoothed fabric finish impressed over the exterior of each vessel. By consensus the awkward name coined by MacNeish was eventually changed to "Selkirk Ware" to conform with the focus which it represented (Dickson 1980:51).

Forty-five years of archaeological survey and excavation have greatly expanded the regional extent and complexity of Selkirk. Needless to say, the original concept of the Selkirk focus has been modified significantly. A prolonged analysis and reassessment of Selkirk was carried out by David Meyer and Dale Russell of the Saskatchewan Research Council, beginning in the mid 1980s. Their comprehensive treatment of the subject (Meyer and Russell 1987) remained the definitive published work on Selkirk until relatively recently. Subsequently, Lenius and Olinyk (1990) suggested a minor reorganization of the Selkirk Composite, and Paquin (1995) provided detailed information on one poorly understood complex of the composite.

The "Selkirk Composite" refers to a set of similar technological and stylistic traits identified in archaeological recoveries found over a significant portion of Western Canada, from northwestern Ontario to the Alberta/Saskatchewan border (Lenius and Olinyk 1990:78, Meyer and Russell 1987:4, Syms 1977:71). The most commonly accepted classificatory structure used to bring order to these cultural remains is the Taxonomic System devised by Syms (1977:70-72). Following the Syms taxonomy, common archaeological "assemblages" (from specific site components) are grouped into separate "complexes", which in turn are subsumed under "composites", which finally collectively make up a "configuration".

The Selkirk Composite is considered to be part of the Western Woodland Algonkian Configuration. A related composite within the configuration is the Rainy River Composite. Archaeological components identified as Selkirk have been discovered in the boreal forest regions of northern Manitoba and Saskatchewan, and have also been identified in the southern boreal forest/parkland transition zone of eastern Saskatchewan. A typical

Selkirk Composite assemblage consists of small side- and corner-notched projectile points, numerous varieties of stone and bone tools, and the distinctive fabric impressed ceramic ware with a single row of punctates which is really the key indicator of the archaeological manifestation.

Based primarily on pottery variation, at least four archaeological "complexes" have been identified (Lenius and Olinyk 1990:78, Meyer and Russell 1987:4). These are called Clearwater Lake, Kame Hills, Kisis and Pehonan. Meyer and Russell originally included a fifth complex, Winnipeg River, with the Selkirk Composite, but recognized that its ceramics were sufficiently distinct to warrant it being associated with another, southern complex yet to be identified. Shortly thereafter, Lenius and Olinyk (1990:103) defined the Rainy River Composite, and included the Winnipeg River Complex within it.

The archaeological data representing each Selkirk Composite complex vary considerably in quantity and quality. Clearwater Lake, the first complex to be identified as a regional variant of Selkirk, is primarily represented by surface collections of artifacts recovered from a number of sites located in central western Manitoba and northern Saskatchewan (Hlady 1971). The most abundant pottery type, Clearwater Lake Punctate, characteristically bears a smoothed fabric impression, and a single row of punctates around the exterior rim or neck. Pottery closely resembling Clearwater Lake Punctate has been found in some sites in adjacent northern Ontario, suggesting that the Clearwater Lake complex may be represented there as well (Meyer and Russell 1987:12). There have been no major excavations of Clearwater Lake components.

The Kame Hills complex was recognized during analysis of archaeological remains excavated from a number of sites in the Southern Indian Lake region of northern Manitoba. The primary component used to identify the complex was excavated at Kame Hills, a prolific multicomponent site which yielded 129 Selkirk vessels (Dickson 1980:56). Many vessels from this complex outwardly resemble Clearwater Lake Punctate pottery, including its single row of punctates, although important decorative differences are apparent. However, the most important attribute of the Kame Hills complex is the large proportion of distinctive ceramic plates (approximately 50%) represented in the regional collection (ibid:58). Using the plates, which still bear single rows of punctates, as a key artifact type, the complex is geographically restricted to Southern Indian Lake, the Rat-Burntwood River system and Big Sand Lake, located nearly 100 km northwest of Southern Indian Lake (Meyer and Russell 1987:15).

Kisis complex materials come from north central Saskatchewan, principally Peter Pond and Churchill Lakes. Several sites have been excavated (Millar 1983) and surface collections made on nearby lakes (Smith 1984). Kisis pottery resembles the Clearwater Lake Punctate type. A significant difference is the presence of decorated shoulders, and the application of crushed temper on the exterior of some vessels, roughening the smoothed fabric finish (Meyer and Russell 1987:19). The Kisis complex has only recently been identified although recent archaeological excavation of one of its main sites

(Rollans 1992) has yielded sufficient data for a comprehensive study of the complex to be conducted (Paquin 1995).

Meyer (1981) initially defined the Pehonan complex on the basis of components surface-collected or partially excavated in the Saskatchewan River valley, near Nipawin, Saskatchewan. Substantial excavations had been carried out on five sites, with smaller components discovered on at least four others. The largest site excavated was Bushfield West. Of the approximately 200 vessels eventually recovered in the valley near Nipawin, nearly all appeared similar to Clearwater Lake Punctate pottery. Significant differences were apparent in vessel form and decoration for only a few vessels, all of which exhibit strong S-shaped rim profiles, where the rim is incurvate or externally thickened. Other vessels have angular shoulders; some shoulders are also decorated (Meyer 1984:43). Meyer (1981:33) interpreted the complex to be a basic Selkirk affiliation strongly modified as a result of Plains contacts. After more ceramic data were recovered from within and outside the Saskatchewan Valley, Meyer (1984) re-evaluated the geographic extent of the Pehonan Complex, suggesting that it did not centre on the southern edge of the boreal forest as he had originally suspected. He and others now suspect that the manifestation extends throughout the southern fringe of the Saskatchewan boreal forest and into the northern edge of the parkland (Meyer and Russell 1987:17).

Assessing the characteristics and geographical distributions of these complexes, Meyer and Russell (1987:25, 26) have concurred with the original ideas propounded by MacNeish (1958:47-49) and others (Wright 1971; Hlady 1971) that Selkirk materials represent the precontact remains of people corresponding to the historically known Cree. Carrying the ethnic identification further, Meyer and Russell have noted the surprising coincidence of historically documented band locations with the geographic distributions of the northern Selkirk complexes. Noting that several historically known bands are not represented in the archaeological record, they have suggested that continued research in their former documented territories (which currently are not well known archaeologically) may reveal new Selkirk complexes associated with these latter groups.

BUSHFIELD WEST AND THE SELKIRK COMPOSITE

Bushfield West and several other sites in the Nipawin area were tentatively linked to the Selkirk Composite while only represented as surface collections (Meyer 1977). The diagnostic items were small side-notched projectile points and distinctive ceramics, the pottery sherds being the principal hallmark.

The Selkirk materials in the Nipawin area were seen as something of an anomaly, eventually leading to the definition of a new archaeological complex within Selkirk (the Pehonan Complex; Meyer 1981). That small surface collections of artifacts could be affiliated with a regional archaeological expression such as Selkirk, and yet be sufficiently distinctive so as to require the definition of a new subdivision within that expression, bespoke the strength with which certain artifact classes were associated with Selkirk.

SELKIRK COMPOSITE SITE SETTLEMENT STUDIES

The significant advances in the interpretation of Selkirk culture history during the past 20 years have not generally been matched with an improved understanding of the process by which this history has come about. Archaeological studies of Selkirk have not as a rule focused on the less easily solved problems such as subsistence strategy, seasonal movement and prehistoric ethnic interaction, except in a superficial manner. Despite years of study, the concept of Selkirk predominantly consists of culture historical interpretations, with few studies able to address many basic questions about group life-styles, or of cultural processes.

That these questions have rarely been addressed is not surprising. There has been little attempt at addressing Selkirk variation beyond the "community" level. Selkirk comparative studies have been based at the site level; rarely have elements within the sites been investigated. Thus, we lack awareness of the full range of archaeological remains, the behaviours they represent, that can be found on a Selkirk site. In fact, there is little documentary evidence available to reconstruct prehistoric Selkirk band activities within any kind of site. Most intrasite analyses are restricted to deriving simple functional interpretations, such as hypothesizing "cooking" if a hearth is discovered or "bone smashing" when quantities of broken bone are collected.

The primary reason for the dearth of intrasite analysis rests with the poor preservation conditions characteristic of nearly all Selkirk sites, a common factor affecting nearly all Subarctic archaeological resources (Arundale et al. 1989:87). Most sites are in the boreal forest, in regions where the ground surface consists of bedrock overlain with thin soils that have developed over many millennia. The environment furnishes little depositional material to cover one episode of human activity and seal it from a succeeding visitation. This situation leads to the dilemma of "compressed stratigraphy" (Rajnovich 1983:9), in which archaeological strata are piled one atop the other in extremely thin layers, requiring exacting excavation procedures to separate them. Unfortunately, the environment conspires to obscure any recognizable order in this stratigraphically sensitive situation by introducing tree roots and uprooting, rodent activity, frost heave, and periodic fire and water disturbances (Wood and Johnson 1978). Compounding mechanical disturbance is the chemical destruction usually associated with a boreal forest regime that affects organic remains, rapidly disintegrating them in the acidic soils. This process effectively eliminates the critical botanical and zoological data component from the archaeological record.

Many archaeological excavation methodologies contribute little towards sorting out boreal forest stratigraphy. Often, sites are excavated in arbitrary levels which cut through and fortuitously mix archaeological horizons (Reid and Rajnovich 1985:9). This practice was particularly common in early excavation projects in the region. Today, there is a general commitment to excavate in natural levels, but most perceptible stratigraphic horizons simply represent the remnants of natural soil formation processes rather than former stable ground surfaces. It is very rare indeed to encounter a buried soil horizon such as a paleosol, and even rarer to find artifacts associated with a paleosol.

Given the unfavourable stratigraphic conditions often found in the boreal forest, much archaeological analysis is directed toward sorting out the remains of many occupations which can span hundreds, if not thousands of years. These mixed assemblages obligate archaeologists to develop ingenious methods to separate component parts into some semblance of order so that basic culture history can be reconstructed (Dickson 1980; Hanna 1975; Wiersum and Tisdale 1977).

It is difficult to determine the full range of cultural materials which are associated with a single Selkirk assemblage because of the unavoidable multicomponent nature of these sites. On the other hand, if single components are isolated with some confidence they rarely can be expected to reflect the total range of human activity responsible for generating the archaeological remains, because very few excavations have been large scale, and even fewer have employed block excavations through which activity areas are spatially related and interpreted. Checkerboard excavations, trenches and random test units are fine for site assessment, but block excavations are a prerequisite when examining site structure. The necessity of adopting such a methodological approach in the region has been suggested by Reid and Rajnovich (1985), who point out that the only way to find and identify positively boreal forest habitation areas is through excavation of large site areas (ibid.: 9,10).

That is not to say that all Selkirk boreal forest sites are suitable for "site level" analysis only. There are sites where large samples of artifacts have been recovered, and a large proportion of the site has been excavated. There are also sites that are relatively well-preserved, so that animal bone, artifact clusters and even structural features have remained sufficiently intact to be identified in archaeological context. Unfortunately, few Selkirk sites have the combination of good preservation and large artifact sample size, and have been extensively excavated. Very few have possessed these attributes and represented a single component associated with an occupation which appears to represent a specific regional prehistoric population.

Selkirk sites which have exhibited some of these desirable characteristics have yielded significant information. The type site for the Kame Hills Complex, Kame Hills (HiLp-1), located on the west side of Southern Indian Lake, was excavated by Dickson (1975, 1980) for three field seasons. Over 20,000 artifacts (including 129 pottery vessels) were recovered from 1480 square metres of excavation, which included a block excavation over 20m x 30m in size (Dickson 1980:10, 11, 16). At least 47 hearths were exposed (ibid: 23). The very large ceramic assemblage appeared to be remarkably homogeneous in appearance, and approximately half of it consisted of unique ceramic plates found in no other region of the boreal forest.

Unfortunately, stratigraphy, or apparent lack of it, was a complicating factor on the site. The block excavation was contaminated with non-Selkirk materials (some dating as early as 3300 B.P.), and there was strong evidence that the site had been revisited continually over a long period of time. Despite the size of the main excavation block, there was no attempt to try and establish any form of living pattern on the site.

A second significant Selkirk component is the Lloyd Site, located on the north side of the Saskatchewan River less than 2 km from Bushfield West. The site was assessed in 1981 (Burley et. al. 1982) and excavated in 1982 by Quigg (1983). A wide range of archaeological materials and features (more than 17,000 artifacts and 10 hearths and pits) were found associated with a three cm thick paleosol buried between 10 and 35 cm below the ground surface (Quigg 1983:74). One aspect of the research plan developed for the site was to obtain data on intragroup settlement patterning for the Pehonan Complex (ibid: 76). The site was considered to be a relatively small one in comparison to other Selkirk sites such as Bushfield West, yet was expected to yield a rich and varied artifact assemblage. Therefore, the intent was to sample a large proportion of the intact occupation using block excavation methods in an effort to reveal remains of a wide variety of settlement activities. Although there was no attempt to expose contiguous portions of the living floor, all features were mapped, and wall profiles were drawn to trace the occupation paleosol throughout the excavation block.

Nearly 105 square metres were excavated in three block units, the largest of which was approximately 70 m^2 (Quigg 1983:204). Although no direct evidence was found for the remains of a residence, the pattern of artifact and feature distribution appeared to represent a tipi-like structure containing a hearth, with a refuse pile located within the dwelling. Associated with this structure area was a second refuse pile and one or more boiling pits (ibid. 205, 206). Analysis of the faunal remains suggested the campsite was occupied in the spring, representing a single household, although the limited size of the excavation did not preclude the presence of additional associated residence remains (ibid.).

The Lloyd site remains are significant for their similarities to the Bushfield recoveries, suggesting the sites were the product of the same cultural group. However, there are a few differences in the artifact assemblage, particularly in the ceramics, which indicate that the site may not have been occupied by exactly the same group of people.

More evidence of Selkirk habitation remains comes from Lake of the Woods in northwestern Ontario. There, Rajnovich (1983) exposed the floors of two and possibly three structures at the single component Spruce Point Site. They were identified on the basis of soil compaction anomalies associated with hearths and pits (ibid: 10-14). Rajnovich was able to correlate artifact distributions with features, hypothesizing that the remains reflected living quarters or residences (ibid: 12). Referring primarily to ethnographic data for comparison, she suggested that the floor of each structure resembled the living area of multiple family dwellings of the Mistassini Cree, with sufficient living space for 7 to 11 people (ibid: 66). She could not detect specialized activity areas within the dwellings, other than to remark that the living areas were kept clean, with refuse artifacts clustering in hearths, pits, and along the margins of walls (ibid: 62, 63). Using tests of statistical similarity between ceramic vessels, she suggested that two of the structures were contemporaneous (ibid: 58). She did not comment on inter-residence differences.

ETHNOGRAPHICAL, ETHNOHISTORICAL AND ETHNOARCHAEOLOGICAL CORRELATES

Selkirk studies have been limited by the incomplete nature of the archaeological resources with which they deal. However, the Selkirk Composite does appear to have an ethnohistorical correlate in the Cree, who are hypothesized to have inhabited the region in the late pre-European contact period. Consequently, there has been some attempt at utilizing the sizable ethnohistoric record provided by early European explorers and traders to augment the few social interpretations available from archaeological investigation of the Selkirk Composite. Despite the historic importance of this record, from the perspective of site structure, the ethnohistoric data are disappointingly meagre. What data are available often are of little use in archaeological studies because they have no correlates in preservable material culture (Arundale et. al. 1989: 87) or in campsite organization. In fact, the ethnohistory seems to be more applicable to studies of past migration as a function of the early fur industry, rather than a reflection of aboriginal lifeways as they were before significant EuroCanadian contact. This seems to be particularly the case for the Western Cree, who were originally believed to be historic immigrants to the Saskatchewan River area (Mandelbaum 1979), but who now appear to have preceded the EuroCanadians by several generations at least (Smith 1979; Meyer and Russell 1987).

There is a fairly rich ethnological and ethnographical literature with respect to a few groups of Cree who until fairly recently followed an lifestyle possibly analogous to that of their prehistoric ancestors. The information from these studies is not concerned with ethnoarchaeological matters, but certain aspects of the data are of archaeological application. As such these data may be useful in building models of archaeological site formation, particularly as exhibited on Bushfield West. They will be discussed in subsequent chapters.

CHAPTER 3

THE BUSHFIELD WEST SITE

SITUATION, STRATIGRAPHY AND DATING

Situation

Bushfield Flat, the broad flood plain on which Bushfield West sits, is an alluvial terrace situated approximately 10 m above the shoreline of the Saskatchewan River (Figure 3.1, 3.2, 3.3). At the time of excavation, between 1981 and 1984, the entire western half of the flat with the exception of the few metres bordering the terrace edge was under cultivation. Although the exact date of land clearing has not been established, it is known that this area was among the first of the terraces within the Nipawin area to have been broken for agricultural purposes. A minimal age for cultivation for some parts of the flat is in the vicinity of 80 years. However, the area where Bushfield West was situated was probably not cultivated until the 1950s.

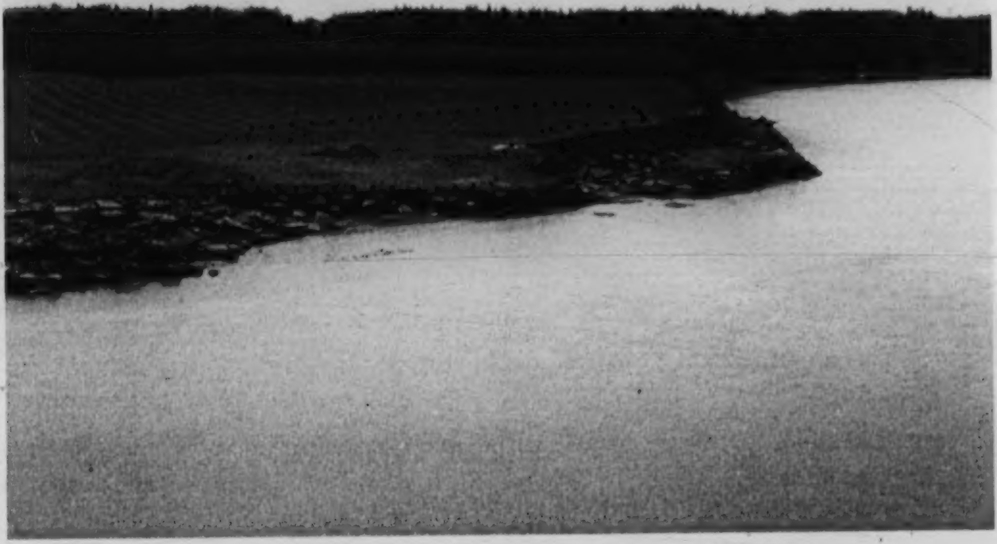


Figure 3.1. Bushfield Flat after spring break-up. Photo looking south. Dotted line shows approximate area of Bushfield West site.

Despite being entirely cultivated by the time of excavation, the flat was probably heavily forested in the past. Floodplains resembling Bushfield Flat and located only a few kilometres upstream on the Saskatchewan River still maintained dense forest at the time of reservoir construction. Air photographs from the early 1930s show Bushfield Flat almost entirely under forest cover. However, periodic ice jamming in the Saskatchewan

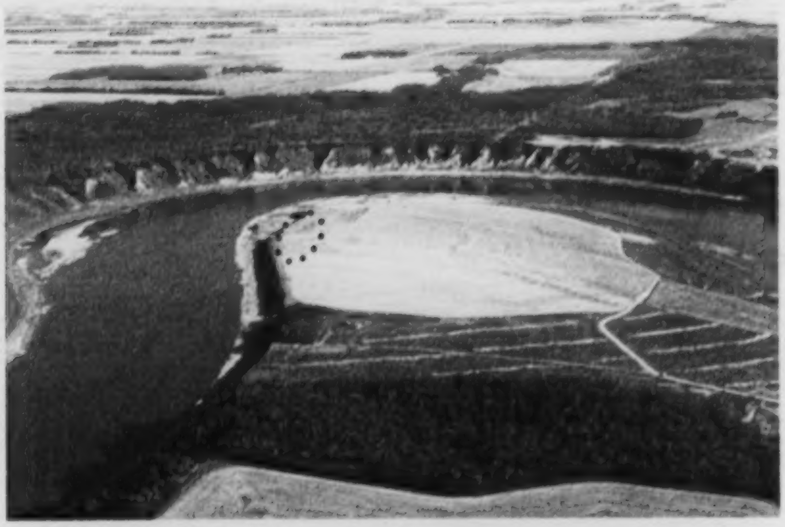


Figure 3.2. 1983 aerial view of Bushfield Flat, after tree cutting in the reservoir area. Photo looking north. Dotted line shows location of site.

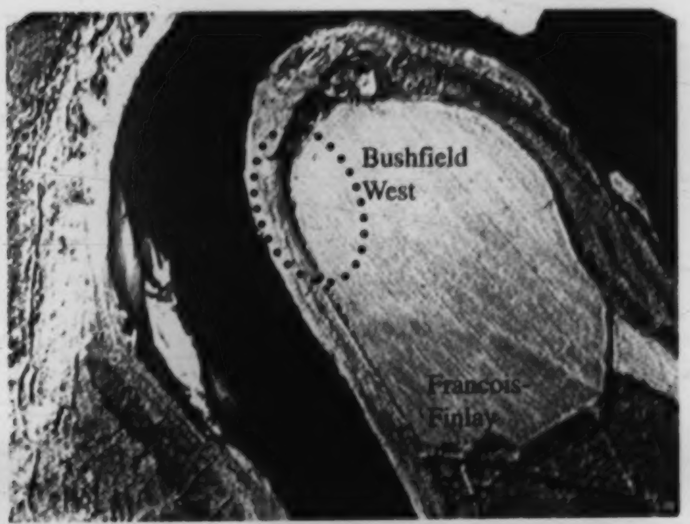


Figure 3.3. 1980 airphoto of Bushfield Flat, prior to tree cutting and extensive gravel quarrying in the reservoir area.

River at varying times caused Bushfield Flat to be inundated and occasionally subject to ice scouring, which tended to devastate the forest environment on the flat. This was probably an irregular but not uncommon phenomenon. For example, in the early 1950s, severe spring run-off caused the river to overflow its banks and flood large parts of the flat. At that time much of the landform was still forested, particularly on the south end. Informants state that river ice was swept over the banks and scraped most of the vegetation away. When the flood waters subsided, the flat was scoured clean and covered with river mud and sand. It was apparently after this event that the whole western portion of the flat was put under cultivation.

It is evident that, at the time of occupation, some parts of Bushfield West may have been forested while others were apparently more open. Vegetational studies of Bushfield Flat suggest that aspen probably dominated much of the terrace on which Bushfield West was situated (Abouguendia and Godwin 1983:17, 18). During excavation, remnant tree root networks were exposed and mapped throughout the living floor of Block 3 (Figure 3.4, 3.5). The forest suggested by these roots may have been contemporaneous with the block's occupation. A few tree roots were exposed in the north half of Block 2, and none were found in Block 1, suggesting that the area in the vicinity of the river edge may have been relatively open, resembling a meadow. This hypothetical clearing could not normally have been naturally caused, based upon models documenting the relationship of ice action to vetgetation development on alluvial terraces found on the Saskatchewan River in the Nipawin area (ibid.:20). It is possible that some form of clearing may have been purposefully made through intentional burning by humans, since occupation would have been more amenable in open areas in which breezes would keep insects away and a view of the river could be maintained. Alternatively, unusual ice formation or breakup may have cleared vegetation in the northwest portion of the flat. Whatever the case, the densest archaeological deposits appear close to the river bank edge. A large quantity of gastropod remains were recovered from the occupation paleosol of Block 2 and Block 3. Although they have not been analyzed at this time, they may provide important information on the environmental characteristics of the two areas (Bobrowsky 1986, personal communication).

Stratigraphy

Sporadic springtime flooding has led to an alluvial build-up which is evident in a buried paleosol sequence on exposed cutbanks. As previously described, extensive ice jamming subjected a considerable portion of the flat to innundation and some surface scouring by ice. Assuming that severe ice jamming regularly occurred on the river in the late precontact and early historic periods, the stratigraphy of most of Bushfield Flat can be confidently explained.

Referring to Figure 3.6, Bushfield Flat from surface to 80 cm below surface is characterized by a series of dark, silty loam strata sandwiched between a somewhat homogeneous tan coloured fine-grained sand deposit. These strata hypothetically represent stable

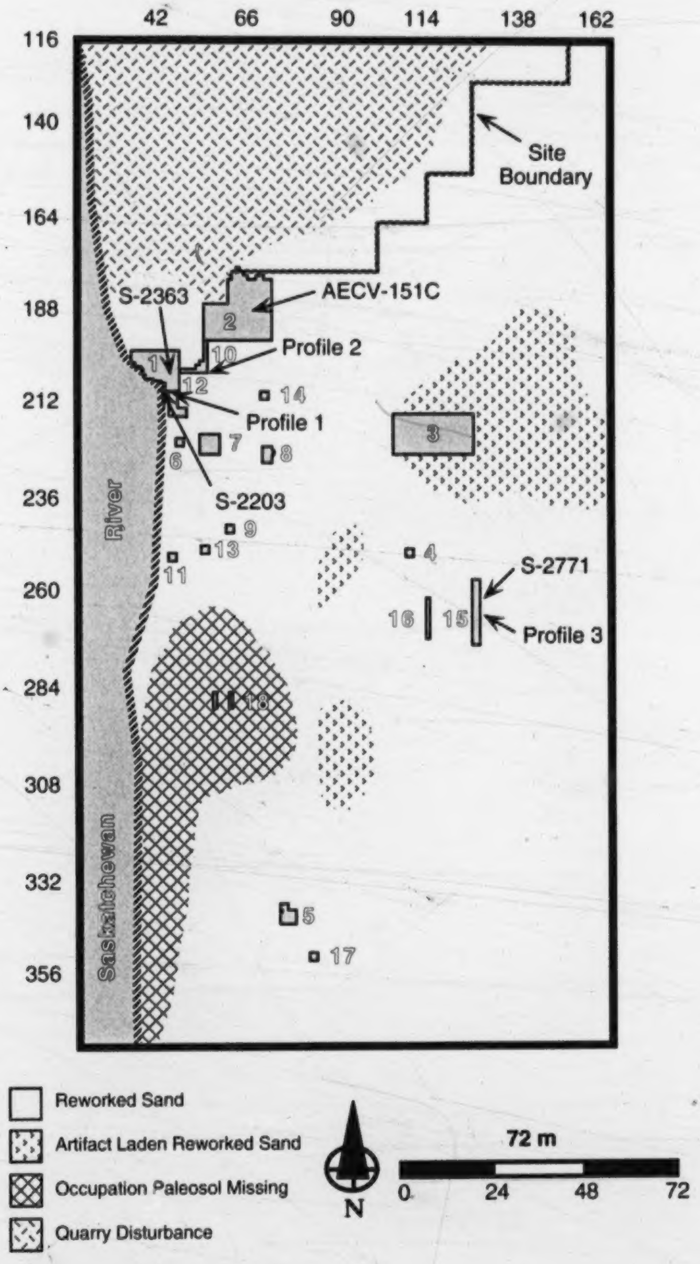


Figure 3.4 . Plan view of Bushfield West site, showing areas of disturbance, redeposition and erosion, and locations of excavation blocks (e.g. 4), profiles (e.g. Profile 3), and C14 samples (eg. S-2771).

soil surfaces where plants took root and initiated normal soil pedogenesis. This process was repeatedly halted when alluvial sand was dumped over the ground surface; presumably during the ice-jamming episodes which caused water to pond over the flat. Occasional strata of coarser sand appear in the profile. This sand has been associated with turbidity, that is, moving rather than standing water. Indeed, it is possible, given the presence of such evidence, that flooding of the flat may have eroded some stable soil surfaces (hereafter called paleosols), eliminating all trace of them in the soil profile.

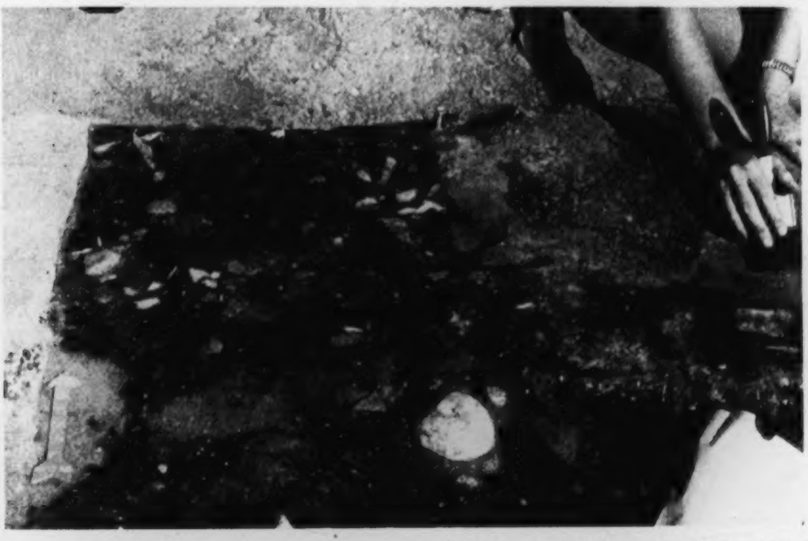


Figure 3.5. Occupation paleosol being exposed in the vicinity of 182S, 69E, in Excavation Block 2 on Bushfield West.

The soil stratum of most interest occurs near the top of the profile (Figure 3.5, 3.7). It is 3 to 5 cm thick, and consists of a silty black, very fine grained sand that appears to extend over much of the northwestern part of Bushfield Flat. This was the only stable soil surface on which evidence of human occupation was found. In fact, in areas in which occupation was especially evident, the paleosol became even thicker, and acquired a reddish tinge. In most areas the deposit above it was a tan coloured sand of fine consistency. In a few areas on the site, however, the sand was overlain by one or more thin dark bands approximately 1 cm thick (Figure 3.8). They may have represented other short-lived stable soil surfaces. Unfortunately, these more recent surfaces were largely obliterated by cultivation. In some areas cultivation penetrated through the overlying sterile sand layer and contacted the occupation paleosol. When this happened, cultural material was spread throughout the plough zone, resulting in the appearance of artifacts on the ground surface.

The occupation paleosol appears to have been a nearly continuous layer spanning a significant portion of the site. A detailed test assessment program undertaken on Bushfield West succeeded in mapping its local extent, and also demonstrated that parts of

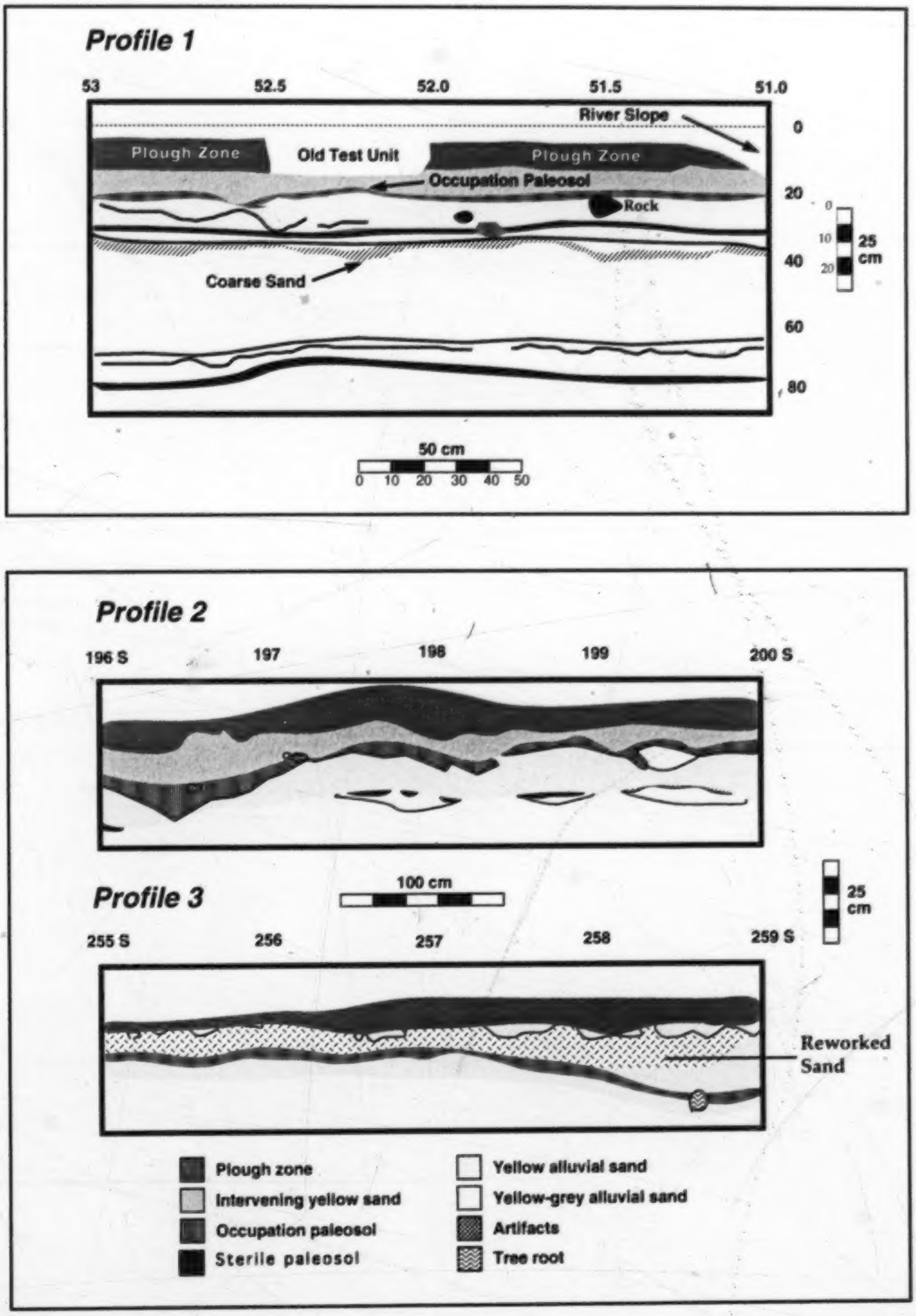
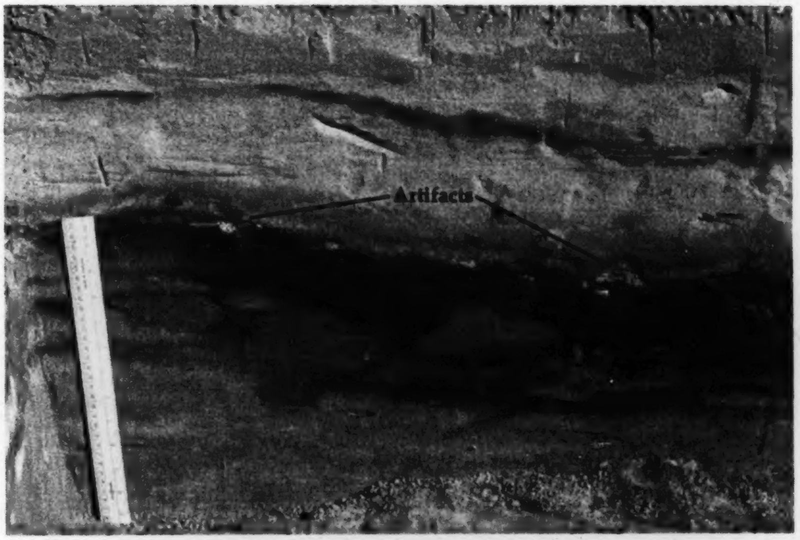


Figure 3.6 Sample soil profiles from various locations (see Figure 3.4) on Bushfield West.



Plough Zone

Fine Tan Sand

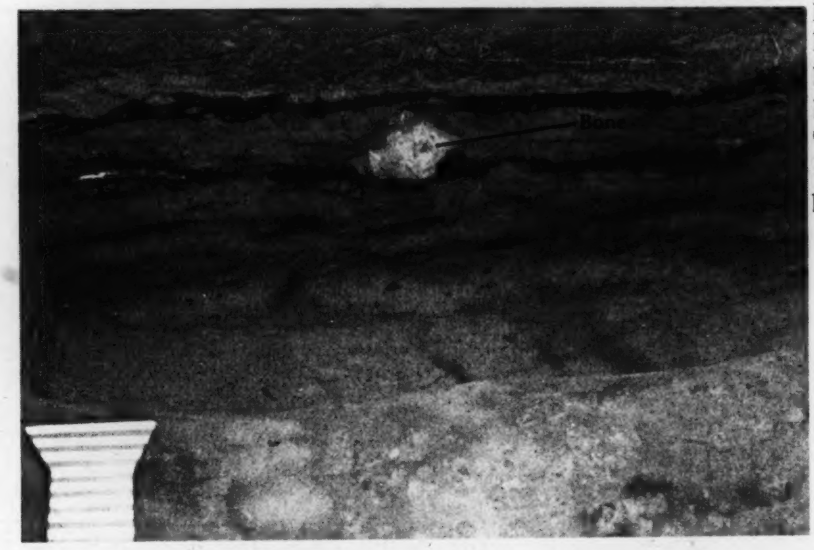
Light Soil Band

Fine Tan Sand

Occupation Paleosol
(note artifacts on top
of horizon)

Fine Tan Sand

Figure 3.7. Vertical profile from Block 2, showing more typical stratigraphy found on Bushfield West.



Plough Zone
Fine Tan Sand
Dark Soil Band
Fine Tan Sand
Occupation Paleosol
Fine Tan Sand
Dark Soil Band

Figure 3.8. Vertical profile from Block 12, showing more complicated stratigraphy found near cliff edge on Bushfield West.

the occupation had apparently been disturbed by flooding (Gibson 1983b). The erosion appears to be associated with a coarse fluvial deposit that overlies the occupation paleosol over the southeastern half of Bushfield West (Figure 3.9). This deposit is shown in the bottom profile in Figure 3.6. In several discrete areas of the site this anomalous stratum was found to contain many larger-sized artifacts, especially pottery and faunal

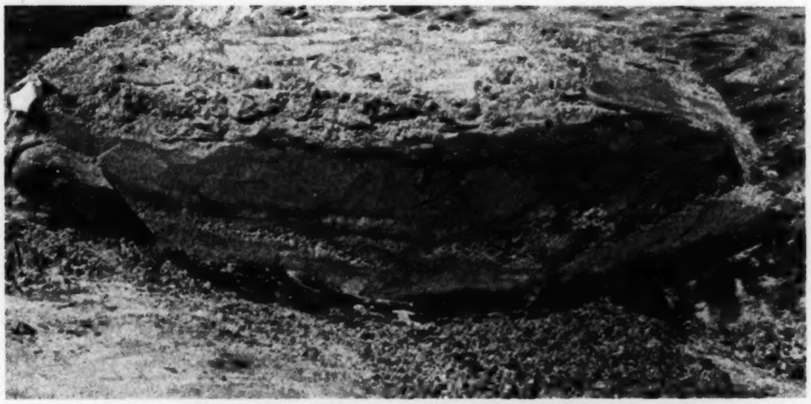


Figure 3.9. Vertical profile from Block 3, showing complicated stratigraphy found in ice-push depressions where thick deposits of artifact-laden Reworked Sand were encountered.

remains.

There are several lines of evidence that suggest that the fluvial deposit, called the Reworked Sand, originated in areas in which the occupation paleosol was missing. The strongest evidence is based on the direction in which the deposits were likely to have been laid down. During excavation of Block 3 a large portion of the occupation paleosol was exposed. The generally smooth paleosurface was interrupted by elongated depressions hypothesized to have been caused by large water-borne ice blocks tumbling end over end, wedging angular impressions into the loosely consolidated sand surface. These ice-push features were aligned in a northwest-southeast direction, suggesting that the ice creating them was propelled from a southwest direction. The features, though pre-dating the occupation paleosol, indicate that the predominant flow of flood water came from the southwest. Referring to Figure 3.4, this pattern is consistent with the trend of the river valley upstream.

A second indication of the sand's origin was its contents. In certain parts of the site the deposit contained a rich assemblage of waterworn artifacts. The artifact-laden sand was screened through 6 mm mesh, yielding several thousand artifacts. Much of this material was recovered when the overburden was removed from Block 3. The most common cultural materials consisted of large fragments of butchered animal bone. A significant quantity of pottery and a number of stone tools were also recovered. Not surprisingly, the deposit was discovered northeast of the area where the occupation paleosol was found to be missing, consistent with the hypothetical flood direction suggested by the ice push features.

Extensive examination of the Reworked Sand deposit overlaying the Block 3 occupation revealed several anomalous features that suggested much about its character. During excavation and screening of the deposit a section of intact occupation was exposed in the matrix 7 cm above the actual occupation paleosol. The dislocated feature consisted of a block of paleosol approximately 50 cm square bearing artifactual material and a quantity of ash on its underside, suggesting that the entire block of material had been flipped upside down. Sectioning of the disconformity revealed that the block was 10 to 15 cm thick, with the artifact bearing paleosol being the lowermost. This find indicates that the flooding that produced the materials in the Reworked Sand was highly erosive and probably associated with significant ice scouring. Rising over the edge of the flat, the ice gouged out large chunks of the ground surface, which were borne away in substantial water turbulence. The fact that intact portions of the occupation were not only produced as a cohesive unit, but obviously tumbled about intact in the flood, strongly suggests that the ground was firmly frozen. This conclusion places the time of the flood in late winter or early spring.

Excavation elsewhere on Block 3 revealed an articulated section of a bison humerus and radio/ulna located directly within the Reworked Sand. This element had been butchered, both the humerus and radius spirally fractured. It is possible that the elements may have been frozen together and displaced as a unit without becoming disarticulated, although it is difficult to see why the elements would be separated from the paleosol so easily and still remain joined. A more convincing explanation is that the elements remained together because they were still joined by connective tissue that had not completely decomposed. This pattern would indicate that the innundation which displaced the occupation occurred within a year or two of the animal carcass being butchered, since ligaments would have presumably disintegrated after that length of time.

The erosive event that displaced the occupation on the southwest portion of Bushfield West did not affect the dense cultural deposits located to the north. The latter area was evidently higher in elevation. This conclusion was demonstrated when the gates of the newly completed Francois Finlay dam were closed in 1985. As the flood waters gradually closed over the flat, the northern portion of Bushfield West was the last part of the site to be flooded.

Dating

Three radiocarbon dates were obtained from cultural materials recovered from the occupation, one from the occupation paleosol, and two more from paleosol strata located between 1 and 2 metres below ground surface of Bushfield Flat. In a recent recompilation of radiocarbon dates from Saskatchewan, Morlan (1993) evaluated the dates, providing calibrations based on the CALIB computer program (Stuiver and Reimer 1986). The uncorrected dates for all samples, and corrected means for each of the occupation-related samples, are shown in Table 3.1. Radiocarbon based chronologies have proven to be imprecise when dating relatively recent archaeological components in the Nipawin region (Meyer 1986, personal communication). Nevertheless, Morlan suggests an average date for the four samples of 422.7 ± 40.0 rcybp (503 radiocarbon years BP calibrated; Morlan 1993: 31, 69). After reconsideration, Morlan normalized the dates following criteria given by Stuiver and Polach (1977: 355-363). The normalization resulted in the charcoal

Sample	Measured BP	Calibrated BP	Material	Comments
S-2771	475 ± 60	518	paleosol	occupation paleosol
S-2203	415 ± 65	580	bone	from fire pit south of Block 1
S-2363	355 ± 155	461	charcoal	hearth charcoal Block 1
AECV-151C	280 ± 120	388	bone	from fire hearth in Block 2

Table 3.1. Radiocarbon dates secured from various localities associated with the occupation paleosol on Bushfield West. Uncalibrated dates are uncorrected and error is 1 S.D. Normalized, calibrated dates are corrected means. Original calibrations were provided by Morlan (1993:31;69). Morlan subsequently normalized the dates prior to calibration, resulting in the two bone dates being 80 years older than originally published (Morlan, personal communication, 1997).

Sample	Measured BP	Normalized BP	Material	Comments
S-2511	7795 ± 105	8120 ± 110	paleosol	2.75 m depth, carbonate fraction, rejected
S-2512	4455 ± 80	4455 ± 80	paleosol	2.75 m depth, organic fraction
S-2287	3350 ± 210	3350 ± 210	organic silt	2.45 m depth
S-2615	3325 ± 105	3325 ± 105	paleosol	1.42 m depth
S-2288	2860 ± 190	2860 ± 190	organic silt	1.7 m depth
S-2625	2175 ± 205	2175 ± 205	paleosol	1.33 m depth
S-2624	2090 ± 195	2170 ± 200	bone	1.33 m depth

Table 3.2. Radiocarbon dates secured from a stratigraphic backhoe trench on Bushfield West. Dating information provided by Morlan (personal communication, 1997).

and paleosol dates remaining unchanged, but the bone dates becoming 80 years older. The calibrated average became 462.5 ± 42.2 rcybp, with a calibrated intercept of 514 BP (Morlan, personal communication, 1997). Taken from a broad perspective, the Bushfield Flat occupation floor was possibly established approximately 500 years ago (during the mid 1400s) and was presumably habitable for a number of years, considering its thickness and the number and size of tree roots it supported in several areas of the site.

Table 3.2 provides a suite of radiocarbon dates taken from a stratigraphic backhoe trench placed 200 m upstream of Bushfield West, on the terrace facing the river. All are from paleosols situated well below the occupation layer. According to Richard Morlan (personal communication, 1997), the dates "show that this landform was actively aggrading throughout the middle Holocene...These dates record at least five episodes of paleosol formation older than the paleosol that contains the Selkirk occupation". Morlan also suggests that the dates indicate that the occupation of Bushfield West could not have had a great time depth.

SUMMARY

Although speculative in some aspects, a recent history of environmental change and human occupation of Bushfield Flat can be summarized. Sometime around AD 1400 Bushfield Flat was severely flooded. In the process the predominantly aspen forest was stripped away leaving a somewhat barren land surface covered with sand and silt. In the ensuing years the flat stabilized and began supporting vegetation, becoming forested once more. In the northwest part, possibly in more open areas where trees had not entirely overgrown the area, a human encampment was established for a short time. Occupation activities hastened deforestation of the northwest part of the flat.

The encampments, seasonal in duration, were revisited for an unknown number of years, perhaps in the mid to late 1500s. Within a year or so of the last occupation another spring flood inundated the flat. It was especially severe on portions which were lower in elevation. Water was swiftly channelled through those areas, bearing ice blocks that ripped up the ground surface in chunks, transporting the debris hundreds of metres in a northeasterly direction. Losing force as the channel widened, the flowing water dropped heavier sand and alluvium containing cultural materials, carrying the lighter silts farther into the interior of the flat. Water ponded over the site, sealing the redeposited materials and the undisturbed ground with fine sand.

The flat in the vicinity of Bushfield West was not re-occupied immediately after the flood, probably because the area was not very hospitable for camping. A new living floor was established, and within a few decades Euro-Canadian traders set up trading posts at the southern end of the flat. At the start of this century Bushfield Flat was partially cleared and cultivated, primarily in its central part. A particularly severe flood again devastated the north end of the flat in the early 1950s, enabling cultivation to be expanded to that area. This activity exposed archaeological materials on the ground surface and the site was discovered shortly thereafter.

Chapter 4

BUSHFIELD WEST EXCAVATION AND ANALYSIS METHODOLOGY

INTRODUCTION

Since analysis of site structure is an integral part of this study, it is necessary to demonstrate the logical consistency between the data recovery methodology, the analytical units defined to describe the data, the technical means of isolating those units and the explanation of the "phenomena of interest" (Carr 1989:2). Due to the nature of the excavation and analysis program, certain strategic decisions were made that had an impact upon the accuracy of information recovery and consequently limited the kinds of analyses that could be undertaken. Bushfield West was excavated under the constraints of a cultural resource management program. Field excavations were limited by time and labour resources. Laboratory analysis and report preparation were not time-limited, although a professional and legal liability remained with the contractor (Saskatchewan Research Council [SRC], subsequently transferred to Western Heritage Services Inc.) and the excavation permit holder (the author) to produce a final report. Labour resources for analysis were also limited. Since the research orientation adopted for Bushfield West was not specifically proposed in the Nipawin Reservoir Heritage Study proposal accepted by the proponent (Saskatchewan Power Corporation), the additional work engendered by the revised research strategy was borne by the author, with assistance from various institutions and many volunteers.

As a consequence of this situation, many techniques and methods of site investigation that could have been applied to the analysis of Bushfield West's site assemblage and structure were not undertaken. Several specialized analytical techniques were undertaken by students as feasibility studies, but were never fully incorporated into the site investigation because they would have taken too much time to do, the students subsequently used the techniques on other sites of direct interest to them, or the students graduated. Some studies are in progress (or currently dormant) and have not yet produced results relevant to this study. Two have recently been completed (MacLean 1995; McKeand 1995), and the results will be addressed at the conclusion of this work.

SITE INVESTIGATION METHODOLOGY

Excavation

All of Bushfield West's *in situ* cultural materials rested on the surface of an easily discerned thin paleosol. Since the remains were not spread vertically throughout the soil profile, large scale exposure of the site occupation floor could feasibly be undertaken, using excavation strategies normally employed on sites containing structural features. Though covered by 25-50 cm of overburden, most of the occupation could be easily exposed using block excavations ranging from four to 300 square metres in size.

All features and artifacts were located using an absolute coordinate system. The basic unit of provenience for excavation was the 50 cm square, which was designated by the location of its northwest corner. Most artifacts recovered from Bushfield West were provenienced within this subunit. Artifacts that were given a point provenience were measured to the nearest centimetre.

Recording vertical provenience was simplified by the uncomplicated stratigraphy. Preliminary field work demonstrated that all cultural materials originated within a single cultural stratum synonymous with a specific paleosol in the site's profile. *In situ* materials were found to have been moved either by natural or artificial means to the Reworked Sand stratum, the plough zone, or the site surface. Consequently, four vertical provenience levels were designated: level 0 (surface), level 1 (plough zone), level 2 (Reworked Sand) and level 3 (occupation). A detailed description of the stratigraphic component contents is provided elsewhere (Gibson 1994).

Levels 1, 2 and 3 will be used throughout this study to refer to the plough zone, the intervening "Reworked Sand" stratum and the occupation. No artifacts or cultural features were found below level 3.

Excavation techniques entailed bulk removal and discard of the plough zone and sterile sand stratum. Shovel shaving was carried out until near contact with the paleosol, then hand trowelling was employed to expose the artifact-laden stratum. With the overburden remnants removed by delicate trowel work, the actual living floor was brushed to remove obscuring dust and debris. The exposed floor was then hand- and photo-mapped in detail, with artifacts and features remaining *in situ* on the exposed paleosol surface. After the recording process, the artifacts were collected in 50 cm x 50 cm provenience units (herein termed a "50 cm square").

Despite the wide range of materials collected, there was very little difference in the kinds of materials found in each area. For purposes of intra-site analysis, all material culture was categorized into seven basic kinds of materials: ceramics, tools, cores, debitage, microdebitage, fire-cracked rock and faunal remains. The definitions of these classes are shown in Table 4.1. Most of the class definitions are sufficiently generalized so as to be comparable to other kinds of materials found on other excavated northern plains and southern Subarctic sites. The definition of microdebitage does, however, differ from other contemporary studies (Fladmark 1982; Hull 1987) in which microdebitage is considered to be any lithic flake less than 1.0 mm in maximum dimension (Hull 1987:772). For Bushfield West, no materials less than 2 mm were examined. Instead, the category was composed of lithic flakes and shatter which would pass through a 6 mm mesh screen, but be caught by a 2 mm mesh barrier. This procedure enabled small flakes (estimated to be greater than 140,000 in number) to be enumerated without the necessity of examining a large sample using a microscope. This definition of small flakes, which has been applied elsewhere (Metcalfe and Heath 1990), proved useful in identifying certain kinds of activity area behaviour at Bushfield West (Chapter 5).

Artifact recovery proved to be a time-consuming process, because of the immense

ARTIFACT CLASS DEFINITIONS

1]	**Ceramics**	Fragments which are parts of baked clay vessels or other objects manufactured for functional purposes
2]	**Tools**	Artifacts of stone, bone or wood manufactured for functional purposes
3]	**Cores**	Residual objects of lithic material resulting from the primary production of flakes
4]	**Debitage**	Waste lithic material 6 mm or greater in size, formed during intentional stone tool working to manufacture tools
5]	**Microdebitage**	Waste lithic material less than 6 mm but greater than 2 mm in size, resulting from the production of flakes or stone tools
6]	**Fire-cracked Rock**	(FCR) Stones which have fractured as a result of being heated and subsequently cooled, resulting from cooking or other functions
7]	**Fauna**	Hard parts (bone, antler, shell) of all organisms with the exception of humans

Table 4.1. Definition of principal artifact classes defined in this study.

quantities of materials which were often encountered. It was not uncommon to expose over 5,000 pieces of microdebitage in a single 50 cm square. Normally, most of this material would have been lost through a 6 mm screen mesh. Recovering this material without sacrificing excavation efficiency required water screening, which could not easily be carried out on the site. Fortunately, all cultural material was recovered on top of or embedded within the thin paleosol. This stratum and its contents was therefore collected as bulk samples from each 50 cm square, removed to the field lab, and screened through 2 mm mesh using a high pressure water hose. The large quantity of materials recovered necessitated the adoption of an automated computer-based artifact inventory system for cataloguing and analysis. These rapid and detailed recovery and artifact inventory techniques permitted 624 square m of occupation floor to be exposed, recorded and collected.

SITE ANALYSIS

The Nipawin Reservoir Heritage Study program was pursued with a multi-problem research design as its focus (Burley and Meyer 1981). One of the problems to be specifically applied to site investigation was the determination of settlement patterning. Research designs for a few site excavations were to address individual occupation units and intra site occupation arrangements (Burley 1982:56). When initially assessed in 1981, Bushfield West was thought to be largely destroyed. Subsequent testing demonstrated that the site occupation was intact, bearing characteristics which made it a likely candidate for the pursuit of an intra-site research approach. This methodological orientation required that large blocks of the site be excavated, and that the extent of the site be determined.

Emplacement of these blocks was guided by the desire to sample many areas of the site. Therefore, a major testing operation was implemented in 1982 to assess site areas in which block excavation would be potentially productive (Gibson 1983a; 1994). A grid of 50 cm square test holes spaced 6 m and 12 m apart were excavated over a 15,000 m^2 area. This operation succeeded in defining the limits of the human occupation, located areas where productive excavation could be carried out, and also provided important data regarding site stratigraphy.

Using information derived from the test assessment program, several areas, located where tests were very promising, were targeted for detailed examination. The first, Block 1, was a continuation of the excavations begun in 1981 at the edge of the river bank. Block 2 was established approximately 25 m northeast of the river bank, very near Block 1.

Block 3, located over 100 m southeast of blocks 1 and 2, was established in an area in which a few discontinuous shovel tests suggested significant buried occupation was present. The area, poorly defined by the traditional testing methodology, was re-assessed using magnetic survey in an effort to locate hearths and pottery concentrations. The prospection methodology, following techniques suggested by Gibson (1982), located several potential hearth and pottery targets, which were eventually excavated in one large 10 x 20 m area called Block 3 (Gibson 1986c; Bobrowsky et al. 1989).

Several other small blocks were excavated in areas in which test data were promising. Data from Blocks 5, 8 and 17, which all contained significant ceramic remains, will be discussed. The locations of all blocks are shown in Figure 3.4.

During the final season a grader was employed to strip as much of the site overburden as possible away from the occupation paleosol in the south part of the site so that any features missed by the testing program could be discovered. This procedure resulted in the isolation of a few hearths, all badly disturbed by erosion and cultivation, yielding little cultural data.

Definition of Activity Areas

Most *in situ* cultural materials on Bushfield West were found deposited in discrete clusters, presumably the residue of spatially distinctive human activities. These clusters varied considerably in their nature and density. Some were represented by accumulations of lithic debitage and microdebitage, apparently resulting from tool manufacture or maintenance. Others were composed strictly of faunal remains, and appeared to be the remains of butchering activity. Many clusters consisted of mixed classes of material, such as faunal remains, debitage and fire-cracked rock. These clusters defied simple interpretation of cultural activity, requiring a more in-depth study of relative concentrations of each class.

Variations in artifact density within the site occasionally complicated the delineation of significant clusters. In most portions of the site discrete accumulations of such classes as debitage and fire-cracked rock (FCR) were easy to identify and demarcate on a map. It was much less obvious to determine if there was significant clustering of less common classes, such as stone tools or cores, since these items could not be discerned reliably when mapped. As well, it was quite plausible that significant behaviour on certain parts of the site would be ignored or minimized if reliance was placed on frequencies of individual classes alone, without considering their associations with other class clusters. Obviously, what was needed was a way of objectively identifying single and grouped artifact classes in terms of density for all parts of the site. As well, a value was required which would establish the concentration of each artifact class per unit area, and enable multiple class density values to be merged into a single artifact density value per unit area. This procedure would enable significant unit areas to be delineated objectively for interpretation of prehistoric human behaviour.

This focus, termed 'compositional patterning' by Ferring (1984:116) is, "the density-free differential spatial distribution of selected categories of artifacts or ecofacts within the minimally dated horizon". Although compositional patterning can be investigated without regard to the clustering tendencies of artifacts, it is also possible to use the methodology to compare isolated clusters as if they were separate assemblages (ibid.:117). Behaviourally, a cluster represents the remains of an activity, and is defined in this study as an activity area. Clusters of apparently related activities are termed activity complexes. An activity complex would include separate but related activities as would be found associated with residence areas, butchering areas and cooking areas.

Cluster Definition

All of the *in situ* archaeological materials recovered from Bushfield West were found on a well-defined, continuous occupation floor. This stratigraphic simplicity, in combination with the excellent visibility attained when the features and their artifacts were swept clean of dust, made the visual definition of distinct artifact clusters a relatively easy task. Unfortunately, as the paleosol around the features was removed for fine screening, it became apparent that the arbitrarily outlined debris accumulations did not accurately reflect the clustering of many artifact classes. For example, although debitage, pottery fragments and faunal material could be seen on the paleosol surface, tiny remains of microflaking were concealed beneath the outer surface of the deposit. These remains did not reflect the deposition patterns of larger items, which were arbitrarily used to define a mapped cluster area. The clustering of such classes as tools and cores was also difficult to map, because they were in such low numbers that clustering was not apparent, and they were rarely identified until they had been removed from the living floor during artifact collection.

A second problem was that the large size of the excavation blocks obligated the excavators to expose only small areas of the living floor at any one time. This procedure ensured that delicate materials such as bone tools or faunal remains would not be exposed to the elements for prolonged periods. Opening the block in piecemeal fashion rendered the definition of clustering more difficult because artifact accumulations were often split between exposed and unexposed portions of the block.

Once the materials were collected and tabulated, the simplest means of defining clusters was to plot the distribution of major artifact classes on maps. All *in situ* materials on Bushfield West were collected in 50 cm square provenience units. Therefore, to produce a class distribution map each 50 cm square of the target grid was inspected for the frequency of occurrence of a material. An arbitrarily defined isoplethic scale was used to quantify the cell frequency, much like a contour map. This method of defining clusters was quite effective when dealing with a single artifact class, but it became unwieldy when dealing with a number of artifact classes. Since each artifact class was represented by a different proportional frequency, each plot had to be contoured at a different interval. Comparing multiple maps plotted at differing intervals proved to be a difficult task, because map clusters tended to merge into one another when directly overlaid. The method was unsatisfactory, because it relied on visual inspection as a means of detecting clusters. For a single class, it worked well enough, but visual inspection was prone to gross impressionistic error when multiple class distributions were overlaid.

A number of spatial analysis studies have attempted to isolate and characterize artifact clustering using quantitative analytical techniques (Carr 1989; Clarke 1977; Hietala and Stevens 1977; Hodder and Orton 1976; Whallon 1973, 1974). Many of these techniques are concerned with defining the boundaries of clusters, some with reference to multiple artifact classes (Berry et al. 1984; Ives 1977, 1985b). Few deal with delimiting the boundaries of a multi-class cluster while providing a characterization of that cluster; that is, compositional patterning. Consequently, the unique conditions offered by Bushfield West required the development of a new quantitative method to define and characterize multi-class clusters. The method used is distantly related to 'Local Density Analysis' as described by Johnson (1984), although it does not involve filtering of grid data or require estimations of site area (Johnson 1984: 83-85).

The Cumulative Concentration Statistic

The primary assumption in the method involves viewing the *in situ* artifact recoveries from Bushfield West as a quasi-statistical "population" occupying a bounded area. The amount of *in situ* occupation exposed on the site was 622 m^2, or 2488, 50 cm squares. Seven major classes of archaeological materials are defined for inclusion in the statistic : ceramics (also termed "pottery"), lithic and bone artifacts (summed together as one class, "tools"), cores, debitage, microdebitage, FCR and faunal material (see Table 4.1 for definitions). The item frequencies of each class recovered *in situ*, with the exception of FCR and bone, are tabulated globally. The latter two classes, because of their tendency to fragment, are quantified by weight (grams). Ceramics fragmentation was also common, but sherd size was felt to be more homogeneous than for either bone or fired rock; thus ceramics are documented by sherd frequency rather than weight. By dividing the global class count (frequency or weight) by the total number of squares excavated, an average or "expected" density for each class per 50 cm square can be evaluated. This density is termed the "Bushfield West Base Concentration." Base Concentrations per 50 cm square for each class are tabulated in Table 4.2.

The Base Concentration indicates that, given the amount of material found on Bushfield West, one would expect to recover 13.56 pieces of debitage or 47.71 g of faunal material within an average 50 cm square. This is a null hypothesis based on an assumption of random, non-purposeful behaviour by the occupants of Bushfield West, resulting in a random distribution of artifacts over the site. This relationship is more fully developed below.

Table 4.3 provides an example of a one metre square area excavated on the site. The average concentration per 50 cm square for each artifact class is taken directly from Table 4.2, and called the "Base". The "Expected" value is this Base multiplied by the number of 50 cm squares, or cells. In the example, the number of cells (0.5 m x 0.5 m provenience units) sampled is four. Thus, the "Expected" value would be equal to the four times the Base. "Actual" represents the actual frequency or weight of materials recovered for each class within the sample excavation. The "Concentration," also known as the "Concentration Coefficient" or "CC" (Gibson 1990), is equal to the Actual recoveries divided by the Expected recoveries. The "% Concentration" (or %CC) documents the percentage of each class represented in the 4 cells, as determined by their Concentration Coefficients. The CC equates the relative abundance of each artifact class per unit area. Examination of the %CC permits multi-class artifact clusters to be directly compared between areas without regard to area size or productivity.

Class #	Class	Freq	Wt (gr)	Base
1	*Ceramics*	8907	-	3.58
2	*Tools*	656	-	0.26
3	*Cores*	569	-	0.23
4	*Debitage*	33731	-	13.56
5	*Microdebitage*	140253	-	56.37
6	*FCR*	-	219829	88.36
7	*Faunal*	-	118711	47.71

cells = 2488

Table 4.2. Calculation of Base Concentration or "Base" for Bushfield West.

Calculating the Concentration Coefficient of a single artifact class for each cell in a

Class	Base	Expected	Actual	Concentration	%Concen
Ceramics	3.58	14.32	12	0.84	3.95
Tools	0.26	1.04	2	1.92	9.07
Cores	0.23	0.92	2	2.17	10.25
Debitage	13.56	54.24	388	7.15	33.73
Microdebitage	56.37	225.48	1821	8.08	38.08
FCR	88.36	353.44	88	0.25	1.17
Faunal	47.71	190.84	152	0.80	3.75
				21.21	100.00%
# cells:	4				
CCs:	3.03				

Table 4.3. Example calculation of the Cumulative Concentration statistic (CCs).

bounded area produces a "Concentration Coefficient matrix," or CC matrix. Plotting such a matrix is simpler than plotting a matrix of raw frequencies per cell, since the plotting parameters are the same no matter what artifact class is being examined because raw frequencies are reduced to "probability" coefficients of a Concentration, ranging from *0* to *n* times the Base Concentration for that class.

The CCs (Cummulative Concentration statistic) represents the Concentration Coefficient summed for all classes, then divided by the number of classes. In Table 4.3, the sum of all seven class CCs' is 21.21. Dividing the accumulated CCs by the number of classes (7) results in the CCs for the unit area, which is 3.03. In Table 4.3, the CCs suggests that, given the average recoveries from Bushfield West, there is a concentration of materials 3.03 times in excess of what "should" be found in the four cell (1 m square) area. This statistic becomes significant if it is calculated on a cell by cell basis for a large area, producing a "CCs matrix." The result is a statistical representation of multi-class material concentration for that area, documented for each cell. Plotting a CCs matrix will provide a spatial summary of general artifact clustering, and is extremely useful in delineating areas of artifact clustering once a level of significance is defined.

Concentration Coefficient maps are interpreted in exactly the same manner as normal cell frequency maps, except that the isopleth or 'contour' interval is normally "1." For interpretive purposes, the interval usually starts at "2," so that cells showing "normal" (i.e., expected) or lower than normal artifact concentration are not plotted. This procedure greatly simplifies interpretation of the plot distribution.

As a concrete example of the technique, frequency/weight data are presented for Block 7 of Bushfield West in Figure 4.1. Five standard distribution plots (A-E) are shown, for Tools, FCR (in grams), Faunal remains (in grams), Debitage and Cores. Microdebitage and Ceramics are not plotted in this example because they were insufficiently represented in the block. The five plots show that clustering is apparent for some classes, but is difficult to correlate between classes, because because each class is assessed by a different frequency/weight interval, making it impossible to compare clusters quantitatively. The example highlights the fundamental problems associated with a simple cluster analysis approach involving analysis of multiple classes of artifacts. There is no standard interval that can be applied in plotting of any particular artifact class. Without a plotting standard, there is no way to compare frequency/weight distributions between classes. Finally, if one cannot reliably compare classes for a given activity area one cannot arrive at any conclusions about compositional patterning for activity areas, no matter if they are determined through visual inspection or statistical cluster analysis.

In Figure 4.2 (A-E) Concentration Coefficients are generated on a cell by cell basis and plotted as separate maps. The examples show how the CC is especially amenable to graphic display. When used to transform a matrix, the residual is a direct display of the "departure" from probability of class occurrence in space. Using the simple ordinal scale established for the statistic, cells displaying a Concentration Coefficient of from 0.50 to 1.49 (for graphic display the statistic is normally rounded up and down to a whole number) possess the "average" or Base frequency/weight. This Base interval (1) is removed from the plot. All cells with a CC greater than or equal to 1.50 are plotted. For example, those cells displaying a "6" contain from 5.50 to 6.49 times the average amount

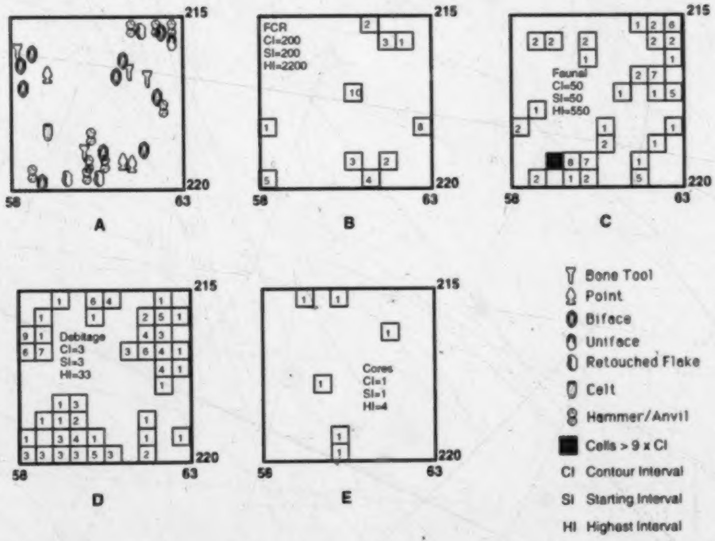


Figure 4.1. Frequency/Weight distributions for five major artifact classes in Block 7 of Bushfield West.

of material found *in situ* on Bushfield West. In Figure 4.2, the most dramatic change in clustering is apparent when dealing with debitage (D). Although the frequency plot would suggest otherwise (Figure 4.1, D), debitage appears in significant quantities only in two cells.

Concentration Coefficient matrices are plotted at the same interval from data comparably derived for different classes. This procedure means that the plots can be physically overlaid (using transparencies, for example) and significant clustering compared. A more

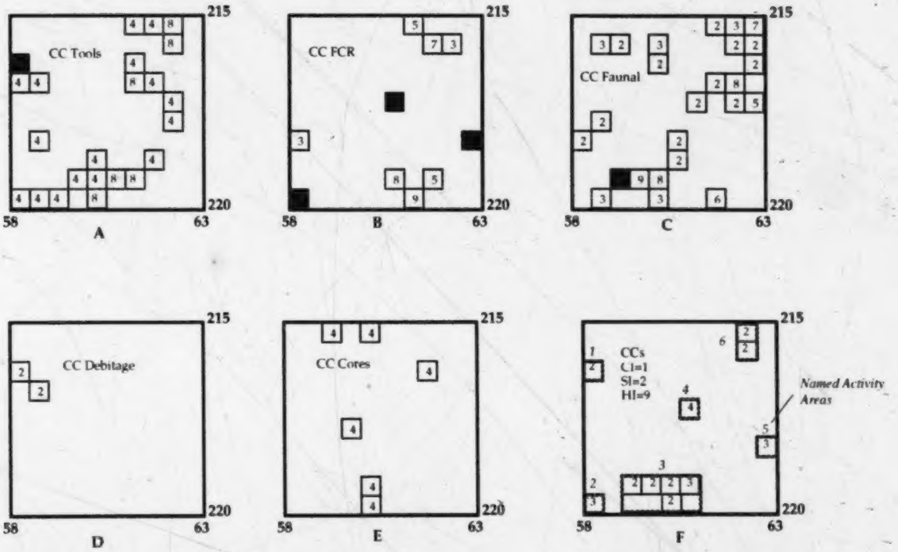


Figure 4.2. Concentration Coefficient distributions for five major artifact classes in Block 7 of Bushfield West. Diagram F shows the result of combining the five class Concentration Coefficient plots into a single plot, called the Cummulative Concentration statistic (CCs).

efficient and powerful comparative tool is derived, however, by combining the separate matrices into a single statistic, the previously defined Cumulative Concentration statistic (CCs). This is done by adding the concentration statistics of each class for each 50 cm square, and dividing by the number of classes. The result of this manipulation for Block 7 is shown in Figure 4.2 F. The CCs residual plot provides a succinct summary of the multi-class clustering for the entire grid. Through its examination, cells displaying significant concentration (i.e., greater than 1.49 x the average concentration) are isolated into "cluster regions." This cluster isolation procedure is undertaken in a simple manner. Significant cells located directly adjacent to one another on a side are considered to be part of the same cluster. If the cells abut one another on a corner they are not normally considered related, unless they are linked indirectly by a third cell (referred to here as "contagious abutment"). For the purposes of this study (and for simplicity of definition), cluster regions are always defined in rectangular units, rather than in many-sided polygons as would normally be defined for cluster region 3, for example (Figure 4.2 F). An example of the cluster definition is provided in Figure 4.3. Once defined the clusters can be characterized through objective examination of their content, as shown in Tables 4.4 and 4.5.

Conclusion

The Concentration Coefficient is a useful technique to define and characterize each of many classes of artifacts distributed non-randomly about an area. The preceding examples suggest that the statistic can be used to define areal clusters for single classes, and through combination (using the Cumulative Concentration statistic, CCs) to isolate multiclass clusters. As well, clusters can be examined statistically to determine individual

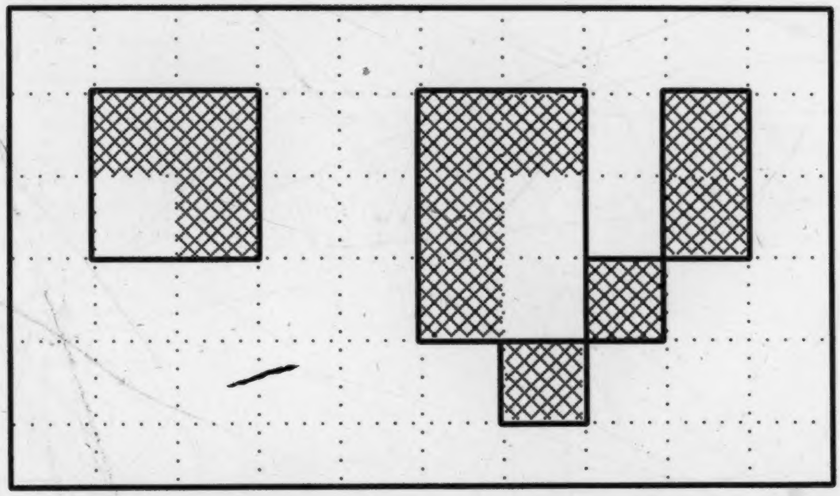


Figure 4.3. An example showing how cluster regions are defined in this study. Significant cells (hatched) which abut one another or are linked through contagious abutment are grouped as regions. Those that do not abut are considered separate. In the example five cluster regions are defined.

Class	Expect	Actual	C	% C
Ceramics	28.64	1	0.03	0.32
Tools	2.08	7	3.80	35.04
Cores	1.84	2	0.96	8.86
Debitage	108.48	75	0.69	6.37
Microdeb	450.96	0	0.00	0.00
FCR	706.88	710	1.00	9.25
Faunal	381.68	1664	4.36	40.16

# cells=	8
CCs=	1.55

Table 4.4. Concentration statistic summary for Activity Area 7.3.

Class	Expect	Actual	C	% C
Ceramics	7.16	0	0.00	0.00
Tools	.52	4	8.70	65.58
Cores	.46	0	0.00	0.00
Debitage	27.17	20	0.74	5.56
Microdeb	112.74	0	0.00	0.00
FCR	176.72	241	1.36	10.28
Faunal	95.42	235	2.46	18.57

# cells=	2
CCs =	1.89

Table 4.5. Concentration statistic summary for Activity Area 7.6.

class content so that behaviour forming the cluster can be inferred.

There are limitations in the application of the Cluster Coefficient and Cumulative Cluster Coefficient methodology. The statistics are heavily dependent upon the resolution of the grid. For example, empirical testing of the method by replicative studies demonstrated that artifact clusters that approached the grid resolution (50 cm) could be bisected or even quartered, so that their "significance" was artificially minimized (Gibson 1986b; 1990). It was found that, when dealing with small areas, carrying out cluster interpretations solely on the basis of relative composition of classes was an untenable analytical procedure. At that level, other sources of data were recommended when the cluster composition was interpreted (ibid.: 27). Also, the method may fail if it is applied to sites in which archaeological components generally overlay one another. Clustering on living floors characterized by multiple occupation can be defined, but the clusters cannot be reliably interpreted. This factor is a fundamental limitation of compositional patterning in general. Clustering in dense living areas, in which material concentrations may overlap or be small in size, will render the statistic less useful in defining single or multiple class clusters. Thus the Cluster Statistic is particularly suited to the "feature" approach (Johnson 1984), presupposing a distinct, unique site occupation, or of repetitive occupations with replication of patterning (ibid.:77).

The statistical validity of the method remains to be determined. The statistic is simply used as a descriptive utility; terms such as "significant" and "clustering" are not meant to have any formal statistical meaning except with respect to this study. Many valid statistical procedures could have been applied to the Bushfield West deposits to isolate clusters. I would argue that most would be ill-suited to this study's focus, being particularistic in their application and unwieldy when applied to the enormous quantity of information available on the site. However, the techniques would be quite applicable to certain artifact classes, and may be attempted in the future.

ARTIFACT ANALYSIS

For the most part, artifact analysis followed the guidelines established by the Nipawin Reservoir Heritage Study (Finnigan and Burley 1982). Stone and bone tool analytical criteria were somewhat revised after publication of the analysis guidelines by the author and staff of the Saskatchewan Research Council in late 1982 and early 1983, chiefly to bring them into accordance with the project's new computer cataloguing and analysis system implemented about that time (Gibson et al. 1984, Gibson and Finnigan 1985). Although more detailed artifact descriptions are available elsewhere (Gibson 1994), for purposes of this study artifact analysis will largely be restricted to the basic categories described in Table 4.1. Ceramic analysis of Bushfield West was greatly modified from the Nipawin guidelines, as detailed in chapters following.

Chapter 5

ARCHAEOLOGICAL RECOVERIES AT BUSHFIELD WEST

INTRODUCTION

The Bushfield West artifact assemblages were recovered from a large site area, and consisted of surface finds, plough zone and water-transported screenings, and in situ recoveries, mostly in archaeological context. Detailed site assessment demonstrated that the occupation paleosol extended throughout most of the site area, but that significant archaeological remains were largely confined to the north half, and especially the north-west portion of the site. It was in this area that intensive exposure of the occupation living floor was undertaken. Excavation areas, called Blocks, were of relatively large extent where paleosol conditions warranted extensive exposure. Eighteen blocks were opened, 11 in the north half and nine in the northwest corner (Figure 3.4). A summary of each of the blocks in shown in Table 5.1.

Only 8 blocks (1,2,3,5,8,10,12,17) yielded sufficient ceramic remains to identify individual pots reliably . As this study is specifically concerned with pottery and site structure, only those blocks that yielded identifiable pots within sufficiently identified activity areas will be discussed. Furthermore, within large blocks, only those areas that produced pottery will be examined in detail. A complete analysis of the entire Bushfield West assemblage is available in a separate volume (Gibson 1994), which contains detailed descriptions of the faunal and lithic assemblages.

Block	Area (m^2)	Vessels	Feature or Interpreted Activities
1	85	9	Domestic residence, bone boiling
2	234	32	Domestic residences, bone boiling, butchering
3	200	4	Domestic residence
4	4	0	Sweat Lodge
5	13	3	Disposal
6	4	0	Unknown
7	25	0	Disposal, bone smashing, butchering
8	10	3	Domestic residence
9	4	0	Hearth (severely disturbed)
10	8	2	Disposal
11	4	0	Unknown
12	10	1	Unknown
13	1	0	Hearth (severely disturbed)
14	1	0	Hearth (severely disturbed)
15	20	0	None (sterile paleosol)
16	10	0	None (sterile paleosol)
17	1	1	Disposal
18	10	0	None (sterile paleosol)
Total	**644**	**55**	

Table 5.1. Summary of ceramic recoveries and interpreted activities from excavated areas of Bushfield West.

In the interest of descriptive brevity, critical information about general artifact recoveries, and stone and bone tool recoveries is summarized in Tables 5.2 and 5.3. Where necessary, portions of Table 5.2 are reproduced elsewhere in this chapter. As well, detailed information about individual activity area content can be found in Appendix A, and a summary of the faunal recoveries is found in Appendix B.

Block	Act. Area	Ceramics	Tools	Cores	Debitage	Microdeb	FCR	Faunal
B 1	*1.3*	499	21	27	1,480	123	2,066	5,730
	1.4	53	4	6	311	0	41	873
	1.5	34	2	1	117	0	0	0
B 2.1	*2.27*	0	3	0	21	0	0	54
	2.42	24	5	9	213	634	2,951	797
	2.43	2,980	106	14	10,100	73,065	8,677	8,761
B 2.2	*2.1*	176	9	3	266	1,226	296	1,552
	2.2	988	47	13	1,686	9,202	11,434	5,761
	2.3	5	2	4	93	705	187	295
	2.4	26	5	3	118	282	1,571	1,359
	2.5	101	5	20	411	1,951	1,583	3,447
	2.6	181	10	4	203	625	89	2,232
	2.7	5	3	4	34	38	1,308	3,009
	2.8	50	9	4	235	489	266	3,159
	2.9	168	14	14	433	759	2,751	4,027
	2.10	21	1	3	41	37	908	290
	2.11	1	2	0	47	77	1,111	1,358
B 2.3	*2.29*	15	7	3	160	487	380	1,835
	2.34	40	8	12	213	560	454	990
	2.35	66	16	12	403	839	2,520	2,216
	2.36	174	5	12	540	3,192	2,197	1,083
	2.37	294	34	10	1,565	7,345	508	1,329
	2.39	16	7	3	166	646	1,397	237
	2.40	111	30	16	2,544	15,081	1,236	2,572
B 3	*3.3*	0	0	0	66	225	0	102
	3.4	0	6	0	117	312	72	301
	3.5	49	0	0	0	0	0	0
	3.6	34	20	26	1,028	7,134	562	1,047
	3.7	574	2	0	20	5	34	194
	3.8	0	0	1	83	10	0	0
	3.10	2	2	0	20	0	0	192
B 8	*8.1*	0	3	0	0	0	0	0
	8.2	648	22	6	565	0	762	1,684
	8.3	19	0	4	59	0	2,472	207
Total		7,354	410	234	23,358	125,049	47,833	56,693
							Grams	

Table 5.2. Summary of artifact recoveries by defined activity area from excavated portions of Bushfield West.

Projectile Point △	Uniface Tool ⬯	Ground Stone Tool ⊗
Biface Tool ⬮	Retouched Flake ◊	Ground Adze ▯
		Bone Tool Ψ

Block	Act. Area	△	⬮	⬯	◊	⊗	▯	Ψ	Total
B 1	*1.3*	2	5	1	6	2		5	21
	1.4		1		1			3	4
	1.5		1		1				2
B 2.1	*2.27*	1		2					3
	2.42		1	1	1	2			5
	2.43	14	24	26	36	6			106
B 2.2	*2.1*	1	2	2	2	2			9
	2.2	11	13	4	11	1	1	6	47
	2.3					1		1	2
	2.4		1		1	1		2	5
	2.5		2			1		2	5
	2.6		2	3	2	1		2	10
	2.7		1		1	1			3
	2.8		3	3	2	1			9
	2.9	3	2	4	2			3	14
	2.10					1			1
	2.11	1		1					2
B 2.3	*2.29*	0	1	4		1		1	7
	2.34	2	3	1	1			1	8
	2.35	4	4	1	5	2			16
	2.36	1			1	2		1	5
	2.37	10	6	5	8	3		2	34
	2.39	2	1		1	2		1	7
	2.40	12	13	3	2				30
B 3	*3.3*								0
	3.4			2	2	2			6
	3.5								0
	3.6	3	10	2	3			2	20
	3.7			1			1		2
	3.8								0
	3.10			2					2
B 8	*8.1*		2				1		3
	8.2	2	5	2	9	4			22
	8.3								0
Total		69	103	70	98	36	3	31	410

Table 5.3. Summary of stone and bone tool recoveries by defined activity area from excavated portions of Bushfield West.

BLOCK 1

Just over 85 square m of occupation were exposed in Block 1. Several fire hearths and rock clusters, and several discrete artifact clusters were revealed. Using the Concentration Coefficient Statistic, 16 discrete activity areas were defined (Gibson 1994), of which three (AA 1.3, 1.4 and 1.5) are considered pertinent to this study (Figure 5.1).

Block 1 was the first major area excavated on Bushfield West. Several minor artifact classes were consequently not dealt with in an manner comparable to that of later block excavations, notably recoveries of egg shell and ochre. Ochre was collected, and larger accumulations were noted during removal. Unfortunately, the material was not documented sufficiently in the catalogue to be quantified objectively. Egg shell was also insufficiently documented until it was found in quantity during the cataloguing of artifacts from Block 2. Nevertheless, it seems probable that very little egg shell was present in the block.

Despite these minor problems, considerable quantities of other remains were recovered, as documented in Table 5.4.

Pottery

Over 650 pottery sherds were recovered from Block 1. Crossmending of many fragments produced the remains of nine vessels, ranging from nearly completely reconstructed pots to small rim sherd remnants. Figure 5.2 shows the distribution of the nine vessels (Vessel 2, 4, 9, 12, 17, 22, 48, 65, 66) within Block 1. Most of the pot remains clustered near hearths or in defined activity areas. Remains of three vessels (V 9, V 17 and V 48) were found outside of activity areas discussed in this study.

Lithic Debris

Within Activity Areas 1.3, 1.4 and 1.5, a considerable quantity of lithic debris in the form of cores and debitage was documented. Most of this debris was composed of Swan River chert (Gibson 1994). About half of the cores and debitage from the entire block came from Activity Areas 3, 4 and 5. Very little microdebitage was collected anywhere on the living floor in Block 1. Although 2 mm mesh water-screening of matrix was not carried out in all parts of the block, the matrix was carefully trowelled. What microdebitage was encountered during excavation was collected. Very little would have been permitted to reach the standard 6 mm mesh ordinarily used to screen backdirt excavated from the block. Thus, the low proportion of microdebitage recovered from this area did not appear to be a function of the altered recovery method. All but 11% of the class was collected within the first three designated activity areas.

Stone and Bone Tools

Sixty-nine percent of the stone and bone tools found in Block 1 were recovered

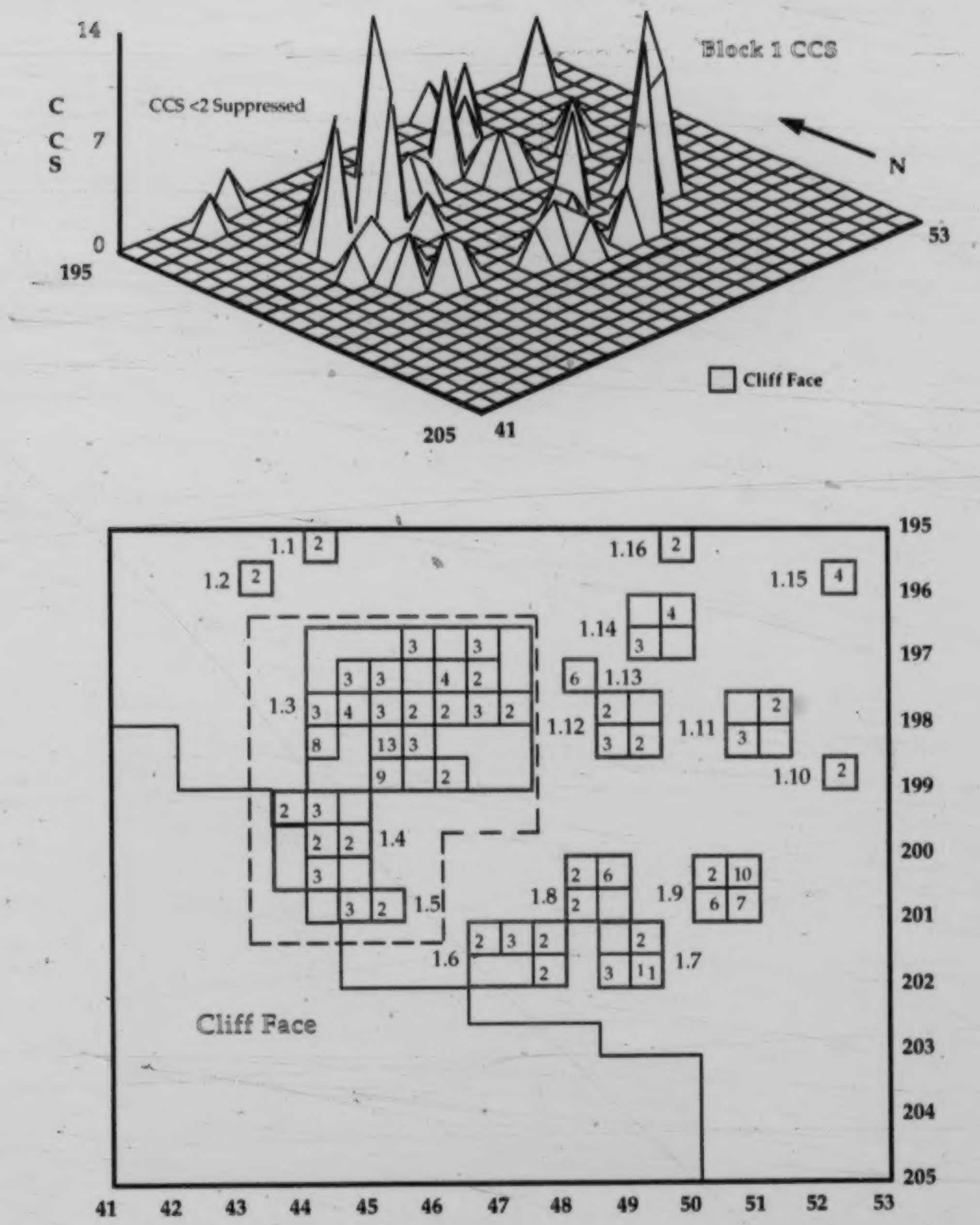


Figure 5.1. Activity Areas defined within Block 1, using the Cumulative Concentration statistic. Stippled line shows areas of interest.

Vessels	9	Stone Tools	52
Sherds	661	Worked Bone	12
Ochre	?	Debitage	2822
Clam shell	37	Microdebitage	146
Egg shell	?	Cores	70
Bone (grams)	17,902	FCR (grams)	51,513

Table 5.4. Major artifact recoveries from Block 1 (Area=85.5 m^2).

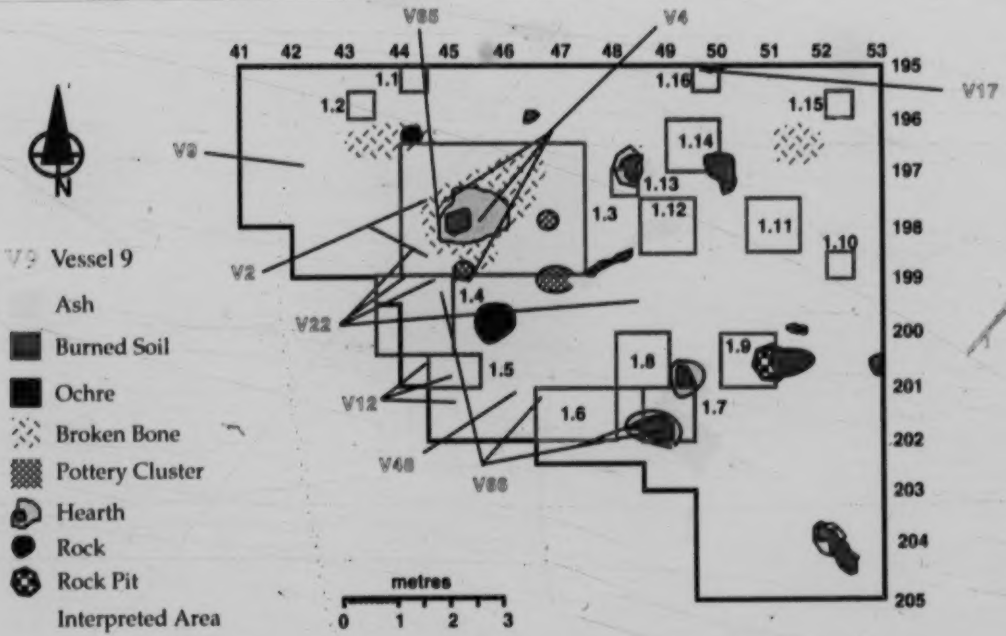


Figure 5.2. Primary features and ceramic crossmends of Block 1.

directly from defined activity areas (Table 5.4; Figure 5.3). Many of the remaining tools were found adjacent to the small statistically defined blocks. Most of the stone tools were bifaces of various types (primarily knives), uniface scrapers and retouched flakes. Only two projectile points were recovered from a defined activity area pertinent to this study.

A number of worked faunal objects were recovered, including several partially drilled shell blanks, a harpoon fragment and an awl. The most interesting recovery in the block

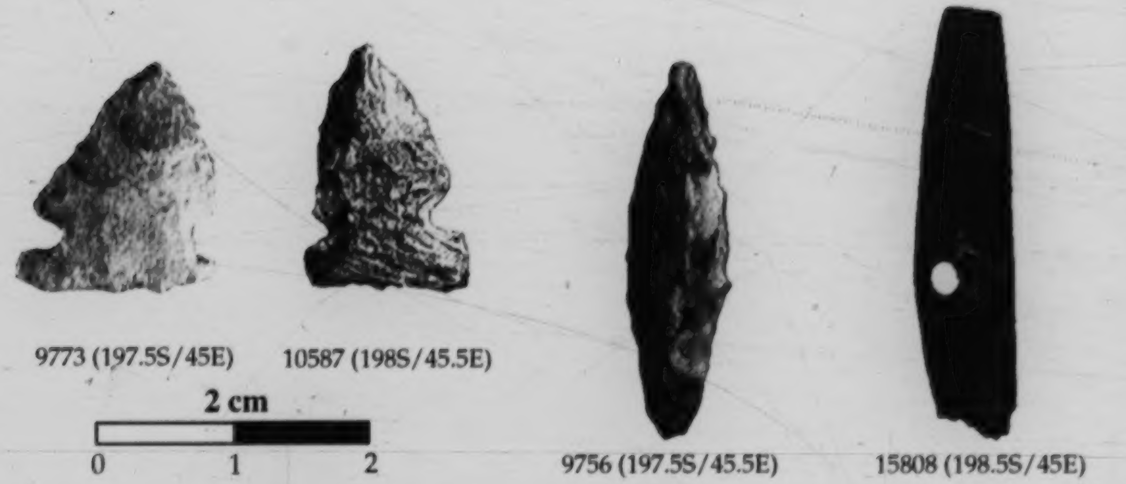


Figure 5.3. Projectile points, drill and harpoon fragment from Block 1.

was a 17 cm long fragment of a large bird long bone which had been polished and bore the partial remains of a drilled hole on one side. The hollow reed-like cylinder was tentatively identified as the remains of a whistle, with the polished drill hole probably serving as one of several finger holes for making various musical notes on the instrument. However, this tool was not found in an area discussed in this study.

Fire-cracked Rock

A large quantity of fire-cracked rock was recovered from the block. Much of this material was found clustered in a few features.

Rare/Exotic Recoveries

As previously discussed, the recovery and analysis methodology used for this block was not as rigorous as that used on subsequent excavations. Consequently, egg shell and ochre recoveries (generally considered rare across the site) were not consistently quantified. In fact, no egg shell was identified from this block, and the amount of ochre was not quantified. However, most of the latter material was recovered in small, discrete clusters, in the form of lump remnants. In an area several metres northwest of the main hearth a small 15 cm diameter patch of the material was discovered to have penetrated into the paleosol for at least 3 cm depth. This distribution suggests that this was a spill of liquefied ochre.

Despite the large area excavated in Block 1, only 37 pieces of clam shell were recovered from the block, primarily in association with activity areas surrounding hearths.

Faunal Remains

A large proportion of the faunal remains from Block 1 were examined, with the exception of bone recovered from units excavated during the first year of testing (1981). Some material otherwise identifiable could not speciated because of the lack of comparative materials. Fish remains in particular could not be identified and are thus excluded from quantification in this study.

In general, faunal material was recovered in relatively good condition. Unlike in some other blocks, a significant proportion of the material was not intensively smashed up into small, unidentifiable pieces. In certain areas of the block some whole bone elements were exposed with little evidence of breakage apart from natural taphonomic deterioration. Secondary damage from burning, weathering and carnivore depredation was found in less than a third of the speciated bone elements. Of those items that did evidence some form of secondary damage, erosion was the most common cause, possibly indicating some exposure to the open air prior to the exposed living floor being buried. Burned specimens of bison, beaver and canids were recovered. The charring suggests that the bones were burned in a hearth, since there was no evidence that the living floor had been subject to natural burns from tree or grass fires.

Estimates of maturity for the speciated elements yield important data about seasonality of occupation for Block 1. Although many of the specimens for all species could not be reliably aged, a sufficient quantity representing the two most common species (bison and beaver) indicates that a significant proportion of the elements were either foetal or immature. These data provide a fairly coherent target for estimating the seasonal occupation of Block 1. Bison calves are usually born in middle to late spring, generally in late April and early May (McKeand 1995:246). Beaver kits are born in late April to late June (ibid.). The recovery of foetal bison remains intact suggests that the cows were in their late stage of pregnancy, sometime between late March and early May. Immature beaver remains would be expected to be recovered after the April birthing period, probably in mid May. The overlapping time between the two species is the April/ May period. These data strongly indicate that the occupation of the Block 1 area occurred in mid to late spring, a time which correlates with the recovery of bird egg shell from other blocks.

Context of Remains

The northwest corner of Block 1 bore evidence of considerable human activity. The central feature was a small, artifact-laden hearth surrounded by dense, localized accumulations of lithic debris, many stone and bone tools, piles of broken pottery, scatters of fragmented and partially fractured bone and small clusters of fire-cracked rock (Figure 5.2). This sort of debris configuration was observed in many other blocks, but certain aspects of the artifact composition were unique to Block 1. The most significant concentrations of materials appeared in Activity Areas 1.3, 1.4 and 1.5. They are summarized statistically in Figure 5.4.

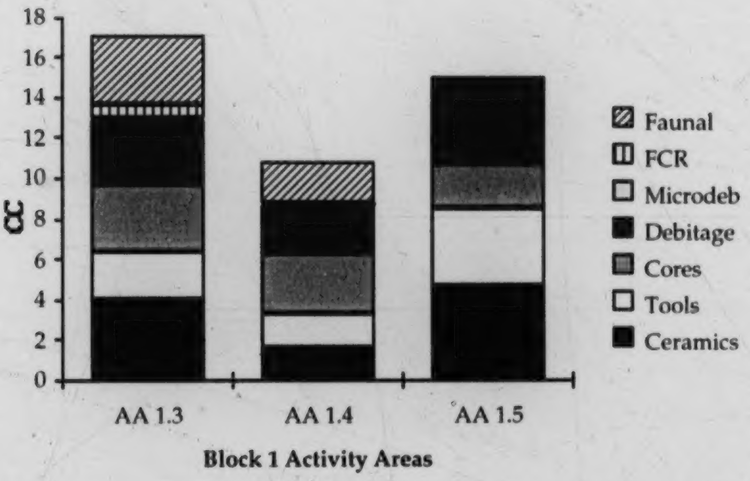


Figure 5.4. Concentration coefficient statistics for selected activity areas in Block 1.

Activity Area Descriptions

Activity Area 1.3 - A glance at Figure 5.4 indicates that this activity area harboured the greatest concentration and diversity of archaeological remains for the entire block. The area contained a particularly dense accumulation of artifacts in the vicinity of 198 south, 45 east. Around this locality pottery, flakes and bone fragments were found piled on top of one another, resembling a midden accumulation. This accumulation was nearly five cm thick in places. At the centre, and overlain by some of this artifactual debris, was an ash lens surrounded by fire-reddened soil. The ash contained great quantities of burned bone fragments, many lithic items and some pot sherds. This hearth was approximately 60 cm in diameter, although only a few cm thick.

The nearly 500 potsherds found in the area represented five vessels (V 2, 4, 22, 65 and 66), although most of the sherds were part of Vessels 2 and 4, which were largely reconstructed. Most of these vessel remains were found in proximity to, or overlying, the hearth ash. Sherds tended to cluster into discrete piles. For example, many fragments of Vessel 2 were found articulated, though cracked, so that part of the vessel could be reconstructed right in the field. It was apparent that the pot had been smashed in place. Remains from Vessel 4 were also found in several discrete piles, permitting the pot to be reconstructed relatively easily.

Activity Area 1.3 appears to represent a multi-purpose working area, of which the hearth was the central focus. Cooking was a major activity, judging by the range of faunal remains recovered in the vicinity. Animals represented included hare, squirrel, bear and elk, along with the apparent staples of beaver and bison. Some beaver (and possibly bird) pieces were roasted. Most animal remains were probably boiled, likely in clay pots, of which the remains of several bearing cooking residue stains were found in the hearth and beside it. A quantity of fish remains were found as well, including one articulated vertebral column, although these remains were analyzed as part of another study (McKeand 1995).

Tool recoveries suggest hide processing and clothing manufacture was also an important activity. Perforating and scraping implements outnumbered knives, and the whole tool assemblage was dominated by retouched flakes. A straight-edged piece of formed bone may have served as a scraper or hide beamer. Some of the perforating tools may have been used to whittle shell, since two shell bead blanks recovered near the fireplace had evidently been partially bored through. Only two poorly formed points were found in the area. At least one may have served as a perforator as well, since its base was too poorly formed to have been hafted very easily.

Although a significant quantity of debitage was collected, hardly any microdebitage was found. The extremely low frequencies can only be partially attributable to excavation technique. Had microdebitage been encountered in even a fraction of the quantities found elsewhere on Bushfield West, 2 mm mesh water screening would have been carried out. The quantities collected by hand in this activity area seem to be what would be expected to occur during core reduction, although this is a subjective opinion based on some replicative studies with similar types of stone materal (cf., Gibson 1986b; 1990). It seems definite that tool making did not take place in the area, although expediency tools (retouched flakes) may have been manufactured. Cores may have been reduced in the area simply to create flakes for making the many expediency tools, thus accounting for the quantity of debitage around the fireplace.

Activity Area 1.4 - This area represents a cluster of materials located directly south of area 1.3, bordered on the southwest by the crumbling cliff edge which marked the western boundary of Block 1. Consequently, the activity area is not completely represented.

Ceramics recovered were for the most part recovered in area 1.3 as well, consisting of conjoined rims and body sherds. A number of sherds could not be directly crossmended and may relate to unrecognizable vessels with characteristic elements (primarily rims) not found in the block.

This area appears to represent a pile of refuse which originated in Activity Area 1.3. The scatter of debitage and cores (with no microdebitage) does not appear to have been created in situ. Similarly, tool remains reflect the character of those from AA 1.3 (hide working), and vessel remains crossmend with that area as well.

Activity Area 1.5 - This small activity area consisted of clusters of pottery and debitage, with several tools. This area appears to have been used for discard. Although there were no ceramic crossmends with AA 1.3, the material probably came from that area.

BLOCK 2

Introduction

Portions of Block 2 were excavated simultaneously with Block 1. Once the first few square metres of occupation were exposed, it became apparent that the cultural remains were significantly different from those of Block 1. The primary difference was one of density; excavation of six square metres of paleosol in Block 2 produced as much cultural material as over 50 square metres in Block 1. Also, a preponderance of debitage smaller than the six mm mesh size of the standard matrix screen was encountered. To be retained for analysis, the upper portion of the occupation paleosol had to be collected along with the microdebitage, and water-screened through two mm mesh. This collection procedure resulted in the retention of many thousands of flakes, tiny bone fragments and clam and egg shell pieces per square metres of exposed occupation.

The following field season major portions of Block 2 were exposed in one large block excavation extending from grid coordinates 59 to 76 m east and from 176 to 192 m south. On the north side, and in the northwest corner, much of the paleosol had been destroyed by gravel quarrying and could not be excavated. Nevertheless, a vast quantity of materials was recovered, surrounding many features, as shown in Table 5.5 and Figure 5.5.

Vessels	32	Stone Tools	417
Sherds	5,867	Worked Bone	34
Ochre	390	Debitage	25,028
Clam shell	468	Microdebitage	129,815
Egg shell	1901	Cores	389
Bone (grams)	63,485	FCR (grams)	88,360

Table 5.5. Major artifact recoveries from Block 2 (Area=234 m^2).

An analysis of the entire block using the Concentration Coefficient Statistic defined 42 activity areas (Figure 5.6 and Figure 5.7). These areas tended to cluster into three separate parts of Block 2, in areas where significant features (and clusters of pottery) were present. For this study, each of these three areas, referred to as sub-blocks, was intensively analyzed. They are described in the following sections.

SUB-BLOCK 2.1

Sub-Block 2.1 was located in the southeast corner of Block 2, surrounding several hearths and an extremely dense artifact scatter (Table 5.6). The artifact content for this sub-block was the largest of any found on Bushfield West. Although the debris appeared to be segregated spatially when exposed on the living floor (Figure 5.8), cluster analysis demonstrated that most of the material was apparently part of a single large activity area

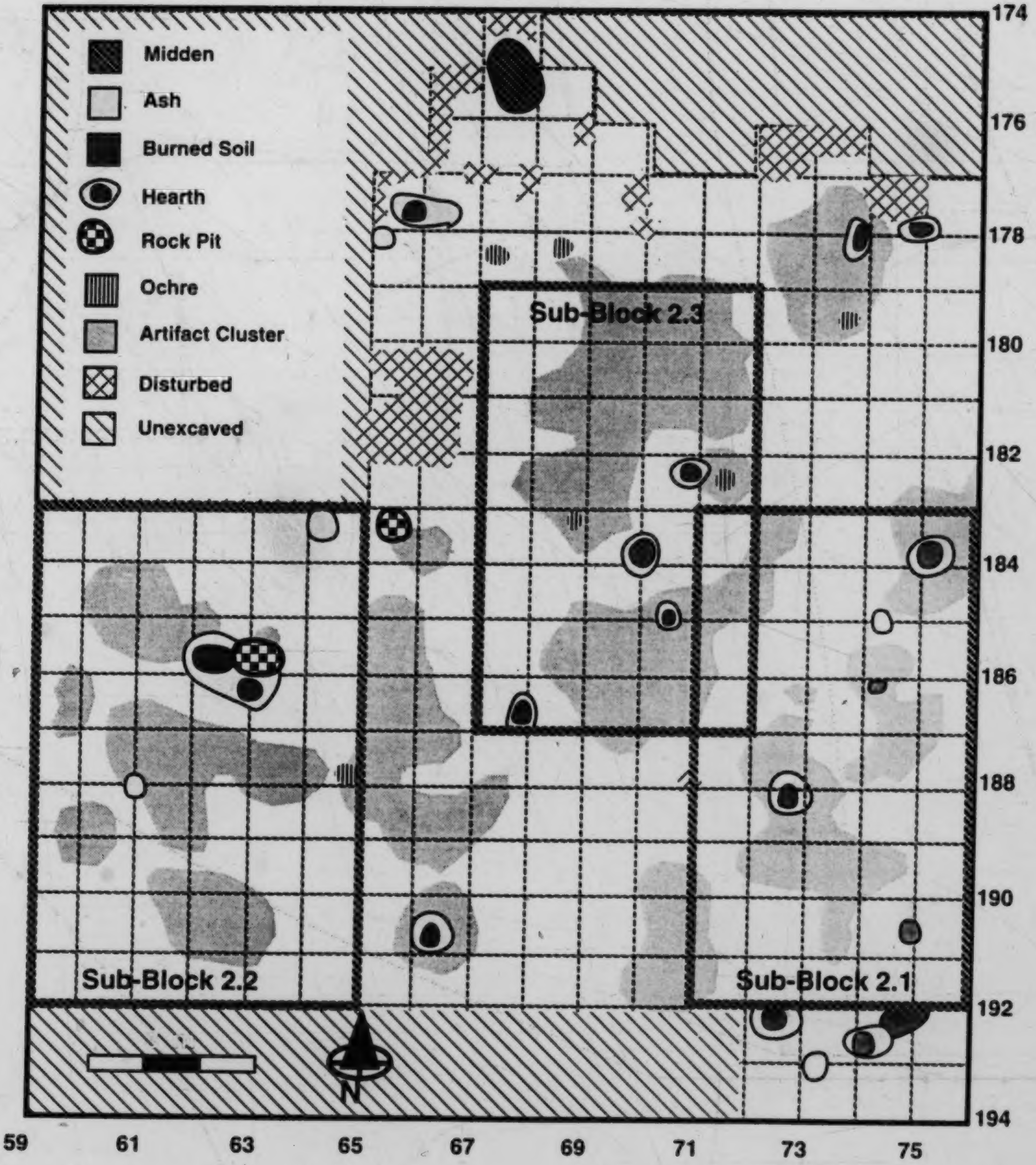


Figure 5.5. Block 2, showing locations of features, visible artifact scatters, disturbed areas and sub-blocks.

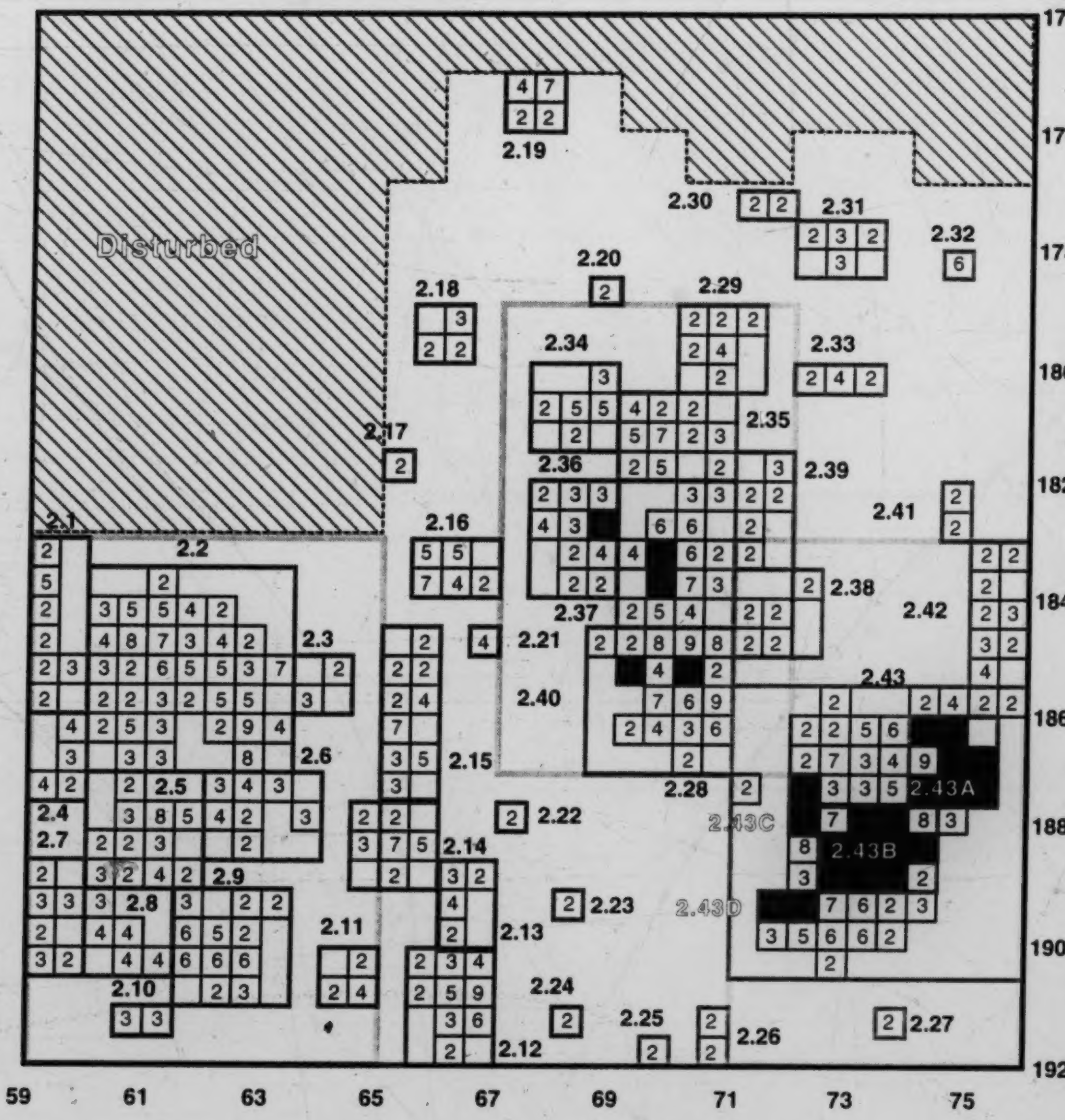


Figure 5.6. Block 2 Cummulative Concentration Statistic plot, showing locations of designated activity areas and sub-blocks.

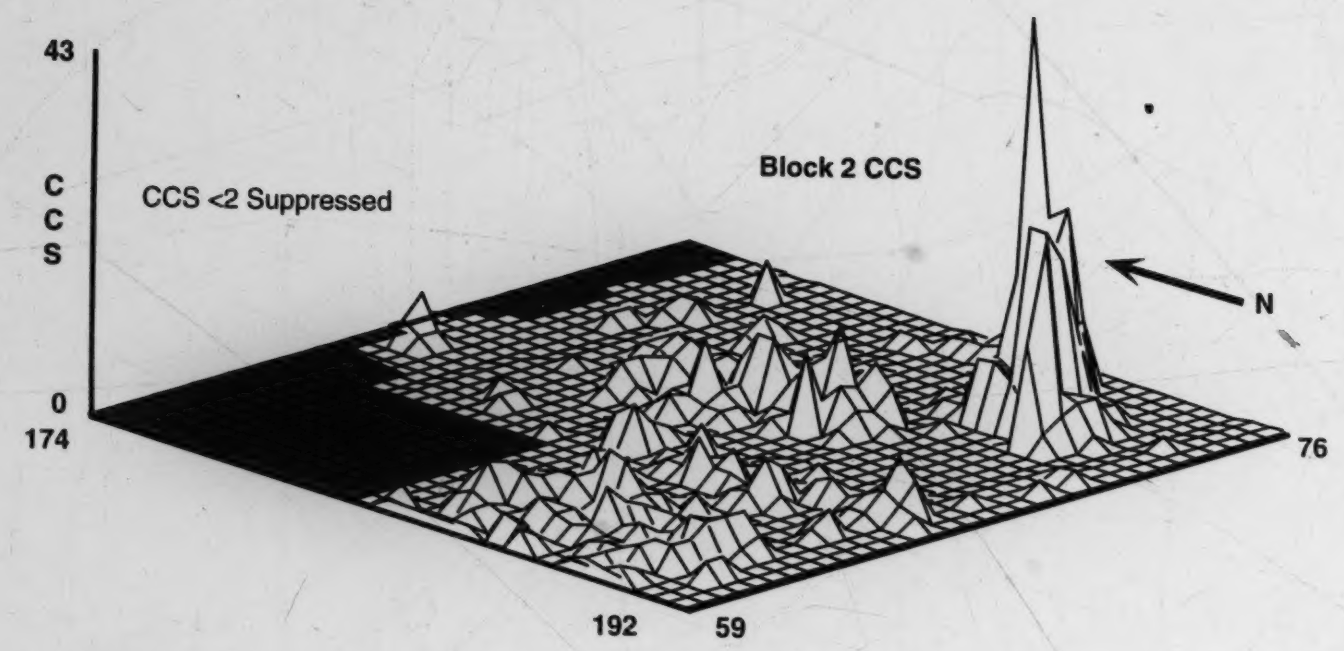


Figure 5.7. Block 2 Cummulative Concentration Statistic plot, oblique perspective.

Vessels	14	Stone Tools	126
Sherds	3,035	Worked Bone	1
Ochre	182	Debitage	11,340
Clam shell	95	Microdebitage	76,240
Egg shell	19	Cores	170
Bone (grams)	13,295	FCR (grams)	13,441

Table 5.6. Major artifact recoveries from the ceramic area of Sub-Block 2.1 (71-76 m E / 183-192 m = 45 m^2)

surrounding the largest hearth, called AA 2.43 (Figure 5.8). Two smaller activity areas were also discerned, AA 2.27, AA 2.38 and AA 2.42. A third small area (AA 2.38) was located in the northwest corner of the sub-block. However, most of its materials appeared to come from outside of the block in Sub-Block 2.3. AA 2.38 is therefore discussed when this sub-block is addressed.

Pottery

Over 3,000 pottery sherds were recovered from the this sub-block. Many of these sherds were reconstructed into nine separate vessels. They were V 3, V 11, V 15, V 19,V 25,V 28,V 51, and V 52. All of these vessels were found within AA 2.43. Their distribution is shown in Figure 5.8.

Lithic Debris

Flakes and tiny microflakes were recovered in discrete clusters on the north and south side of Sub-Block 2.1, and in general profusion in the centre. In the area surrounding the large hearth at the centre of the block, in Activity Area 2.43, debitage was recovered in several layers, some approaching five cm in thickness. Debitage was usually mixed with microdebitage, bone and broken tools. Nearly 75,000 pieces of microdebitage alone were recovered, over 98% from AA 2.43. One hundred seventy cores were also found, nearly all from Activity Area 2.43.

Stone and Bone Tools

Sub-Block 2.1 yielded 1114 stone tools (Figure 5.9). Nearly 90% were found in Activity Area 2.43. All tool classes were represented with the exception of stone celts and bone tools.

Fire-cracked Rock

In general, little fire cracked rock was collected from this sub-block. A small quantity was exposed south of the large central hearth and around the second hearth in the sub-block's north-east corner. The remainder of the material was scattered over the area, showing no particular clustering.

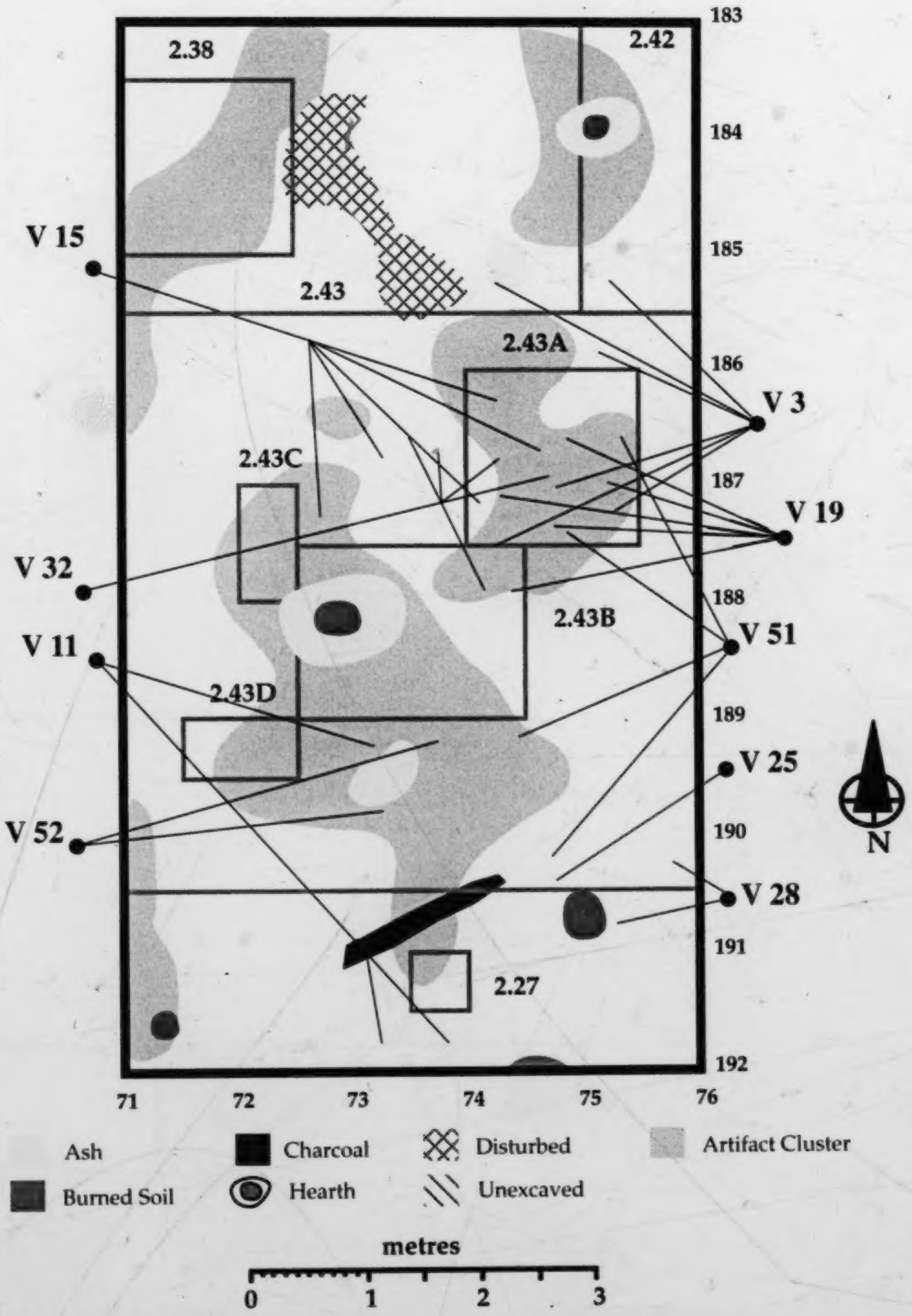


Figure 5.8. Primary features and ceramic crossmends of Sub-Block 2.1.

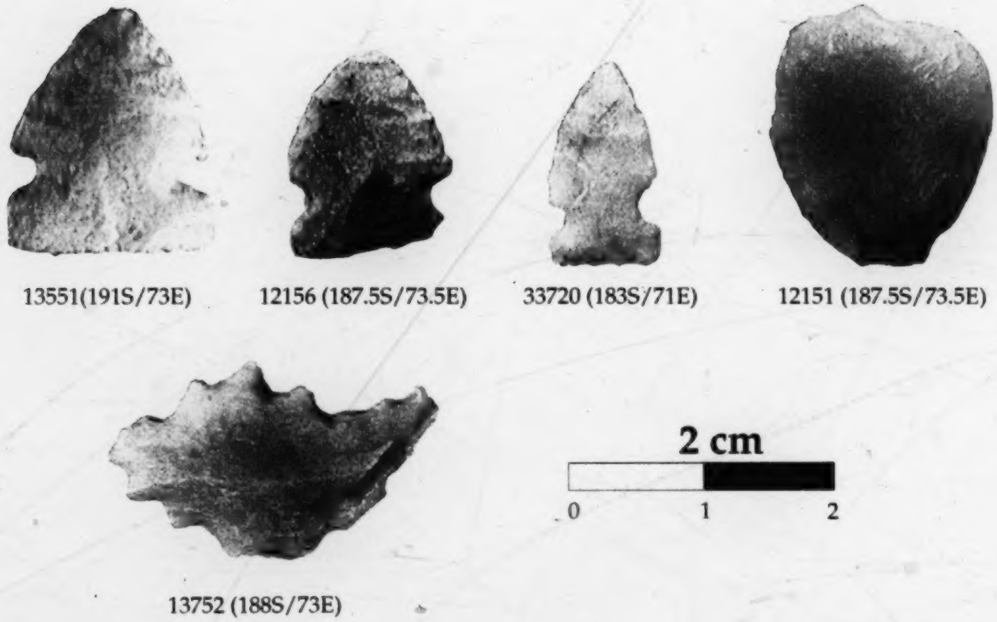


Figure 5.9. Projectile points, end scraper and miscellaneous uniface from Sub-Block 2.1.

Rare/Exotic Recoveries

A few important exotic recoveries were found in Sub-Block 2.1. Three pieces of dentalium shell were recovered approximately one metre northeast of the hearth (187 south, 74.5 east) in a dense debris cluster. This was the only place on Bushfield West where this exotic, imported shell was found. Local clam shell was a very minor recovery, although a few pieces of shell bore drill holes. These artifacts were regarded as part of the bone tool class.

Only a few pieces of egg shell were recovered during excavation. However, as this was one of the original areas excavated, some egg shell may have been accidently discarded or misidentified. Ochre was not recovered in clusters as in other areas of Bushfield West. Rather, much of the pigment was found as discrete pebbles distributed within the general debris scatter surrounding the large hearth of AA 2.43.

Faunal Remains

The only fauna analyzed in detail for this sub-block came from Activity Area 2.43. Therefore, the following summary pertains to the material recovered from that large activity area.

Bone material had been intensively smashed, leaving few whole or even partial elements present. This process made identification difficult. The three most commonly represented species by NISP were bison, beaver and grouse. Most other species were only nominally represented, with the exception of unspeciated canids and muskrat.

Maturity data were inconclusive in regards to season of locality use. With reference to bison and beaver specimens, there were no foetal elements for either species, and a small number of immature bison and beaver elements. The immature beaver specimens suggest that sub-block occupation may have occurred in the late spring.

Context of Remains

This block was located in the southeast corner of Block 2. Several hearths and a dense artifact scatter were encapsulated within it. Four separate activity areas were identified, although the bulk of the artifacts, including the pottery, came from one large, dense scatter. Activity area content is shown in Figure 5.10.

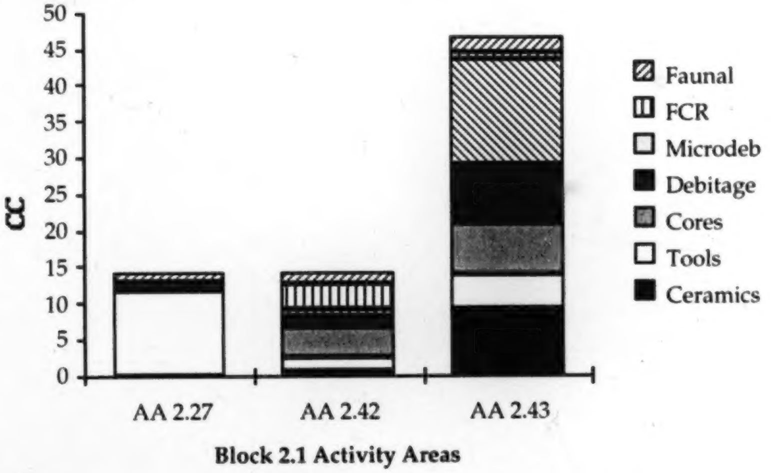


Figure 5.10. Activity Area content (Concentration Coefficient) for Sub-Block 2.1.

Activity Area Description

Activity Area 2.27- This 50 cm square contained a small quantity of unrecognizable bone fragments, a few flakes and three tools. This cluster of material, displaced to the south of the main cluster of debris in the block by more than a metre, probably represented secondary discard from AA 2.43.

Activity Area 2.42- This tightly defined activity area surrounded a hearth located in the northeast corner of Sub-Block 2.1, centring at 183.6 m south, 75.2 m east. The hearth was small, less than 50 cm in diameter. It consisted of debitage and broken bone laden ash overlying a red-orange burned soil lens. Surrounding the hearth on the north, south and west sides was a general scatter of debris, including debitage, microdebitage and faunal material. The east and northwest sides were relatively sterile. A loose cluster of fire cracked rock appeared south of the hearth, with fragmented bone in association.

Some pottery sherds were also found, in the area south of the hearth.

There is little evidence that this activity area is functionally related to AA 2.43. Even the ceramic crossmends are too distant from the area to argue for a link. The hearth is small and appears to have been the centre of several activities, the most significant being stone knapping, tool manufacturing and perhaps some bone smashing. The strongest evidence for tool making is the coincidental presence of a quantity of locally obtained altered felsic lava flakes with two broken tools of the same material. This work resulted in the creation of a batch of waste flakes and the manufacture of several tools, which probably accounted for the presence of the large quantity of microdebitage. This exercise apparently took place adjacent to the fire, for the area surrounding the debris scatter was relatively sterile. The limited extent and quantity of the recoveries and the smallness of the fire suggest that this area represented an outdoor fireside workshop in which one or two individuals were present.

Activity Area 2.43- Activity area 2.43 was the most prolific of any on Bushfield West. Cultural debris was literally piled high around a large fire hearth located at 188 m south, 73 m east. Surrounded by white and yellow ash, charcoal and piles of debris, the feature was packed with more ash, charred bone, potsherds and flakes and underlying it a thick layer of red-orange soil, suggesting that it had been fired intensely. Very few fire-cracked rocks were found in association. Extending to the southeast of this hearth were extremely dense clusters of smashed bone, lithic detritus and pottery. On the north side two pottery clusters and a dense cluster of lithic debitage were also uncovered. The densest artifact concentration appeared on the northeast side of the hearth, slightly apart from the southeast trending artifact distribution. In portions of this cluster potsherds, flakes, formed tools and bone were thickly accumulated, especially in the area of 186 m south, 74-75 m east. These artifact clusters consisted of every kind of refuse mixed together with silt and heaped into shallow mounds on the paleosol surface. The "middens" were in places several metres in areal extent. Their excavation revealed no discernible stratigraphic layering. Northwest and west of the hearth, the living floor was much less densely covered, yielding only moderate amounts of pot sherds, bone splinters and flakes.

Although there appeared to be distinct clusters of debris within the general artifact scatter incorporated by AA 2.43, it was difficult to define these areas objectively using the cluster analysis methodology. The concentration of materials tended to overload the statistic, so that nearly the entire area appeared significant. Four areas of extreme artifact concentration were isolated, however, and designated sub-activity areas 2.43A to D (see Figure 5.6 for their locations). Unfortunately, their arbitrary definition (all cells with a concentration of 10 times expected or greater) did not make them especially amenable to detailed analysis of activity area behaviour. Nevertheless, the sub-areas are referred to occasionally in the following analysis.

A vast quantity of debitage was recovered from AA 2.43. Evidently, intensive core reduction was taking place in this locality, especially on the south and west sides of the fire. Detritus from this activity was apparently discarded in area A, located northeast of the hearth. This processs probably accounts for the high proportion of cores and flakes recovered from that area. Microdebitage, probably the product of tool making, was recovered in abundance in the AA 2.43, especially on the southeast and northwest sides of the hearth in subareas B and C.

Based upon breakage patterns and tool distribution information, bifaces and points (nearly all fractured) were apparently manufactured in the vicinity of the hearth (Subarea B), and discarded when broken. On the other hand, few unifacial tools were recovered broken. Most unifacial tools were distributed throughout the activity area in a largely unbroken state. They may have been on-the-spot discards or losses, suggesting that hide preparation work was carried out in the area, perhaps concurrent with flintknapping activities.

Subarea A, located away from the fire, yielded fewer tools, and in different proportions than area subarea B. Most of the tools were complete, and of diverse functions, suggesting that tool making was not the primary activity in this subarea. In fact, it is probable that most tools were discarded, augmenting the hypothesis that subarea A was used for disposal, either primary for waste material, or defacto (cf., Schiffer 1972) for complete, unbroken tools[1]. Only a few tools were recovered in subareas C and D.

The analyzed faunal remains from Sub-Block 2.1 largely pertain to Activity Area 2.43. The hearth and its surrounding features contained a diversity of species remains, although only beaver, bison and grouse were significantly represented. The large number of grouse remains was an anomaly exclusive to this activity area. Bison and beaver carcasses were disproportionately represented in the area. In the case of beaver, unusually large numbers of skull pieces (principally teeth) and phalanges were found, scattered throughout the area. The low number of appendicular elements may indicate that only a few individual beaver carcasses were processed in the activity area. Bison specimen counts tended to be the reverse of those of beaver. A majority of front and hind elements were identified, with only small numbers of axial elements. The large number of front and hind appendicular specimens suggests that parts of several animals were processed in the area. Apart from being intensively broken up, few bison specimens exhibited any signs of direct butchering, and none bore evidence of firing, despite the presence of the hearth in the activity area, and the fact that it contained a great quantity of calcined bone. Obviously, roasting of larger pieces of bone was not undertaken, as was apparently the case with other activity complexes in other parts of Bushfield West.

Most of the bison and beaver remains in AA 2.43 were from adult individuals. A significant number of immature beaver specimens were also enumerated. As indicated above, this pattern suggests that the activity area may have represented a late spring/early summer occupation. This is in accord with the recovery of egg shells in the area. The absence of foetal bison bone is perturbing, however, since foetal bison elements were found in most other activity complexes. This absence may indicate that the Block 2.1 was occupied later in the season than the other blocks, or simply that pregnant bison were not processed in the area.

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[1] In this chapter I have made use of a simplified artifact deposition terminology first set forth by Schiffer (1972; 1976) to describe debris distribution. In the subsequent chapter, when certain activity areas are re-examined, more complex depositional models will be developed and used to interpret the archaeological remains.

The nearly 3,000 pottery sherds collected in the activity area could be mended into nine identifiable ceramic vessels. None of the vessel remains were found in any other activity area in Block 2, or even within Sub-Block 2.1. This distribution suggests that AA 2.43 was the locus of use for all but the most poorly represented pots. In fact the most completely represented vessels (V 3, V 15 and V 19) were recovered almost entirely within the dense debris scatter northeast of the hearth in sub-area A.

SUB-BLOCK 2.2

This area comprised the excavated portion of the west edge of Block 2. It enclosed several dense artifact concentrations, two hearths and a rock pit (Table 5.7). Cluster analysis objectively defined 11 activity areas (AA 2.1 to AA 2.11), most of which appear to be related to the areas surrounding the hearth/rock pit features (Figure 5.6, 5.7, 5.11).

Pottery

Portions of 14 pots were reconstructed from nearly 2,000 sherds recovered from this sub-block (Figure 5.11). The vessels were: V 6, V 10, V 18, V 38, V 39, V 40, V 41, V42, V 43, V44, V 45, V49, V61 and V 62. Most vessels were found spread through many activity areas within the sub-block, but were not found beyond its arbitrarily defined boundary.

Lithic Debris

Debitage and microdebitage were recovered in discrete clusters throughout the sub-block, but were especially abundant in the area west of the hearth and rock pit features.

Vessels	14	Stone Tools	91
Sherds	1826	Worked Bone	16
Ochre	48	Debitage	3,727
Clam shell	54	Microdebitage	15,694
Egg shell	289	Cores	76
Bone (grams)	28,449	FCR (grams)	23,337

Table 5.7 Major artifact recoveries from the ceramic area of Sub-Block 2.2 (59-65 m E / 183-192 m S - Area = 54 m^2).

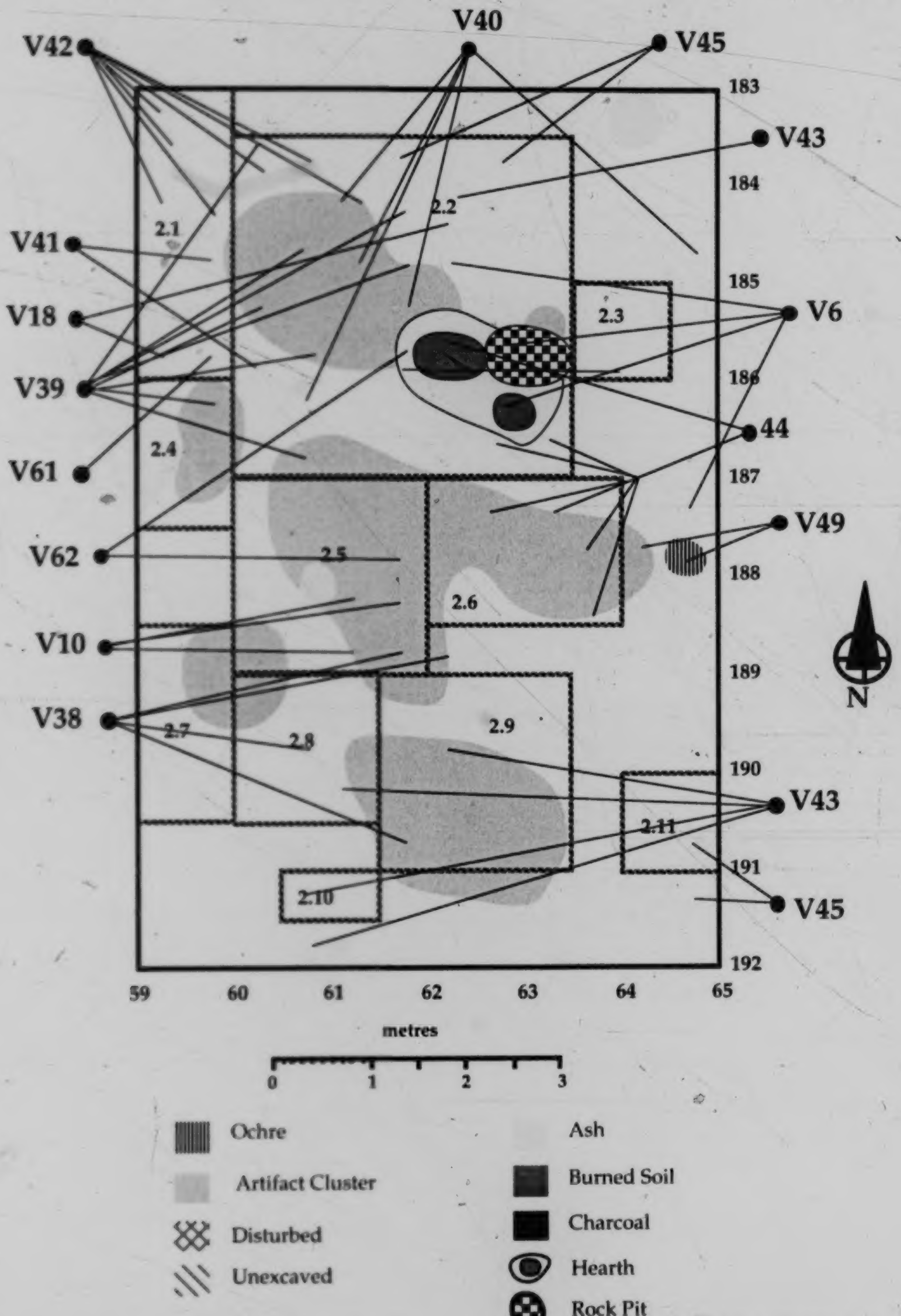
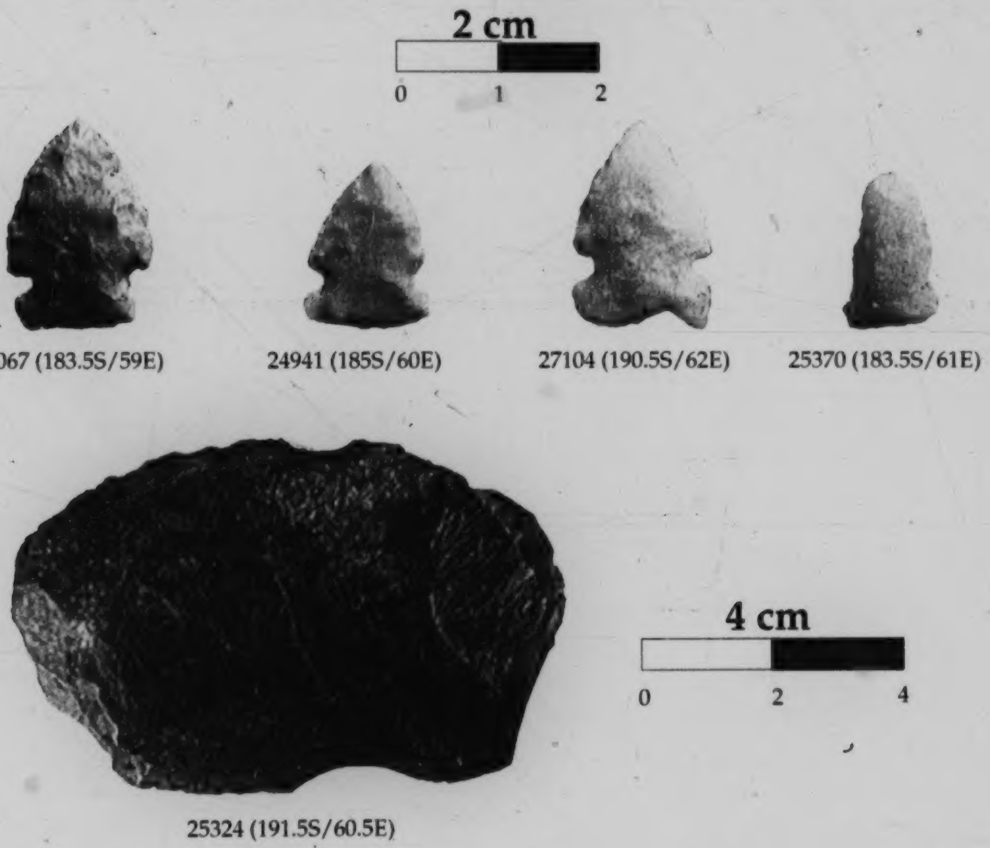


Figure 5.11. Features, artifact distributions and ceramic crossmends of Sub-Block 2.2.

Over 3,500 flakes and 15,000 micro flakes were collected, plus 72 cores.

Stone and Bone Tools

Ninety-one stone tools and 16 bone tools were collected from the sub-block. These tools were spread fairly evenly throughout most of the activity areas. All tool classes were represented; the only celt found in Block 2 came from this sub-block (Figure 5.12).



24067 (183.5S/59E) 24941 (185S/60E) 27104 (190.5S/62E) 25370 (183.5S/61E)

25324 (191.5S/60.5E)

Figure 5.12. Projectile points, drill bit and celt (ground adze) recovered from Sub-Block 2.2.

Fire-cracked Rock

Not surprisingly, of the approximately 23 kg of rock recovered from the sub-block, most came from the single rock pit located in AA 2.2. In other areas such rock was ubiquitously scattered about as small fragments, usually mixed in with unidentifiable bone and lithic debris.

Rare/Exotic Recoveries

A considerable quantity of egg shell and clam shell was found, primarily in the area west of the hearth and rock pit features. No discrete dumps or patches of ochre pigment were discovered in this sub-block. Although many small fragments were collected, they tended to be randomly distributed throughout its boundaries.

Faunal Remains

Over 28 kg of finely smashed bone were collected, dominated by bison and beaver specimens. Among the many faunal fragments identified was a single foetal bison specimen and many immature beaver elements.

Context of Remains

This sub-block was located west of Sub-Block 2.1, on the west side of Block 2. A number of activity areas were identified within it (Figure 5.13). A considerable quantity of pottery, yielding many reconstructable vessels, was recovered. This locality was unique in that it exhibited characteristics which suggested that it was a residence, and also the centre of food processing activities which are normally believed to have been carried out in an unsheltered area.

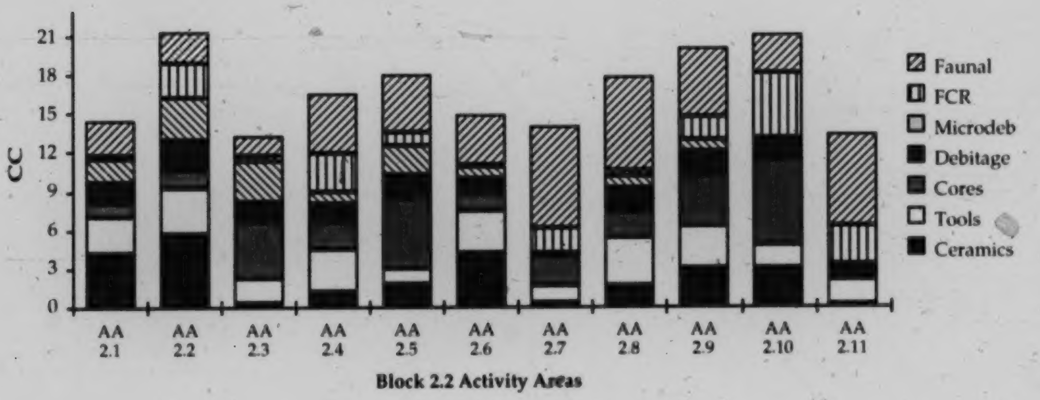


Figure 5.13. Summary of Activity Area content for Sub-Block 2.2.

Activity Area Description

Activity Area 2.1- This area was defined by the contents of three one m^2 units situated on the edge of the excavation block. Although portions of this area may have been disturbed by heavy equipment blading, no features could be discerned, other than a dense accumulation of many types of artifacts. A quantity of sherds representing parts of Vessels 18, 41, 42 and 61 were recovered. With the exception of V 61, these vessels were found in AA 2.2 as well. Nine lithic tools were collected, including a complete Plains Side Notch projectile point. With the exception of the point and the hammerstone, all items appeared to have been broken, either during use or manufacture.

The material content and its homogeneous mixture suggests that the area was used for secondary disposal. The source of the materials, based upon ceramic crossmends, appears to have been Activity Area 2.2.

Activity Area 2.2- AA 2.2 was the largest defined activity area in Sub-Block 2.2. A very dense deposit of artifacts was exposed in the north-west portion of the area, with lesser but significant scatters of material appearing elsewhere. Dominating the area's centre was a rock filled pit and two fire hearths. The pit was approximately 50 cm in diameter and over 20 cm deep. It contained about a score of large and small complete and fragmented quartzite cobbles. Apart from a few small pieces of bone, there was little else. Although the pit was located adjacent to the two hearths, detailed excavation of the three features demonstrated that the pit overlapped the west hearth, and may also have intruded on the south one as well. The two hearths did not appear to intrude on one another and seemed to be surrounded by a common ash layer, which actually overlay the top of the rock pit as well. This pattern suggests that all three features may have been relatively contemporaneous.

Nearly 1,000 potsherds representing 10 vessels were found in the activity area. The vessels were V6, 18, 39, 40, 41, 42, 43, 44 and 45. Few of the vessel remains were restricted to this area, although the majority of the crossmended fragments associated with nearly all of the pots came from within the area.

Nearly half the tools for the entire block were found in this one area. Nine projectile points were recovered. All but two were broken, consisting primarily of medial/tip sections or side-notched bases. The area contained a large amount of fire-cracked rock, most coming from the rock pit. Large and small pieces of fired rock were found scattered throughout the area, particularly along the north edge, in no particular cluster. The hearths contained very little FCR.

In this area tool making and food processing activities dominated. There may also have been some hide and clothing repair, although it is difficult to sort out the tools used for this work from those that were being manufactured. Cooking was important, since a number of broken pottery vessels were recovered in an area in which two large hearths and a rock pit were located. Also, 14 of the 71 identifiable bone fragments had been charred, suggesting that some roasting took place there. Although the rock pit was intrusive to at least one of the two hearths, there was little evidence to suggest that the pit represented re-occupation of the locality at a later date. Rather, it appeared that it was constructed after the larger, west hearth was already in use, and that the same hearth was used again in conjunction with the south hearth, perhaps to heat rocks for the new rock pit.

Activity Area 2.3- This 1 x 1 m^2 area was located immediately east of the rock pit in AA 2.2. When exposed, an accumulation of bone fragments, tools and debitage was noted on the paleosol, apparently functionally unassociated with the pit feature. Only a few pottery body sherds were retrieved from the area, none crossmendable with defined vessels from the site. This small cluster of materials was probably discarded debris from AA 2.2.

Activity Area 2.4- This activity area was centred over a cultural debris scatter located one metre southwest of the major artifact cluster associated with the fire hearths in AA 2.2. The debris was piled to a depth of nearly six cm into an elongated, shallow depression on the occupation floor. The depression, apparently a natural hollow in the paleosol surface, also contained charcoal. Parts of the feature surface appeared to have been reddened by firing, although no ash was noted. The occupation floor immediately to the west of the depression rose up considerably in the profile, and had been truncated by grader blade. It is possible that the somewhat restricted area of the cluster may have been larger in extent, and extended significantly to the west into unexcavated ground.

Twenty-six pottery fragments recovered from the depression included parts of Vessel 39, the majority of which was found in AA 2.2. A considerable quantity of faunal remains was found in the shallow depression. The bone was in a fragmented condition. In addition to the bone debris, a small amount of fire-cracked rock were recovered.

As in the case of AA 2.3, this area, based on the presence of the ceramic crossmends, was probably at least part of a dump from AA 2.2.

Activity Area 2.5- This activity area, located about one metre southwest of the hearth/rock pit features in AA 2.1, encompassed a densely packed deposit of cultural debris similar in character to that found in AA 2.1. The only significant feature was an ash patch located at the centre of the area, containing finely smashed bone and flakes.

Over 100 pottery sherds were recovered from the area, although only three vessels could be identified. Part of Vessel 62 was found in the scatter, crossmending with a fragment found north of AA 2.2. Another vessel, V 38, crossmended with fragments from AA 2.8 and AA 2.9; both activity areas located adjacent to AA 2.5. The third vessel was a tiny miniature, V 10. It was found entirely within the activity area.

Some of the non-faunal debris from this area appears to comprise some form of discard, possibly from AA 2.2, although ceramic conjoins seem to suggest from the south as well. The presence of microdebitage and debitage clusters indicates that tool making (or repairing) also took place in the area. The faunal remains, predominantly beaver and bison, may have been broken up directly in the locality, using the rock and the large hammerstone that was abandoned there.

Activity Area 2.6- Within this activity area cultural debris was scattered about in much the same manner as in AA 2.5; however the material was much less densely distributed. This area contained about half as much debitage and microdebitage as was found in AA 2.5. No specific lithic debris cluster was noted in the activity area during excavation, although a dense artifact cluster was exposed in the SE quarter of 187S, 63E. No significant features were observed within the debris. Although nearly 200 pottery sherds were recovered from the area, only parts of Vessel 44 could be recognized in the collection. A large circular anvil was recovered within a scatter of finely smashed bone pieces.

This area was probably a combination dump and bone smashing area, like AA 2.5, located adjacent to it. Bone was not smashed as intensively in the area, however. Since there were no specific clusters of debitage, this material was probably scattered about as part of general waste disposal, probably from AA 2.2, or even AA 2.5.

Activity Area 2.7- This activity area was located on the west edge of Sub-Block 2.2. It was characterized by a general scatter of large bone pieces, large rock fragments and an occasional flake. A shallow hollow in the paleosol surface was present in the south half of the area. Smaller bone fragments and a few lithics had accumulated in the natural depression. No other significant feature was observed in the area.

Only five pottery sherds were found in the activity area; none conjoinable to defined Bushfield West vessels. A number of large fired rocks, and a few unfired cobbles were found in the artifact scatter. It is probable that they were used for bone smashing.

Like Activity Areas 2.5 and 2.6, this area was also a dump site and bone smashing locality.

Activity Area 2.8- This area contained the remains of several debris distributions located on its west, north and east sides. Although no significant features were found, debris was generally heavily deposited throughout the area. Fifty pot sherds were collected but only Vessel 38 was represented among them. As in most of the other activity areas, the floor of this area was strewn with a quantity of smashed bone. The bone tended to be less fragmented than in areas to the north, nearer the hearths.

Although there was a considerable variety of materials distributed within this area, no significant cluster of the non-faunal remains was apparent. It appeared that flakes, cores and tools had been scattered about the area in no particular pattern. Thus the area was probably used for bone smashing and secondary discard, as had the other areas located south of AA 2.2.

Activity Area 2.9- This activity area almost completely encompassed another dense cultural debris scatter measuring several metres in diameter. The scatter included a quantity of smashed bone, broken pottery (some vessel sections only partially scattered) and lithic debitage. Although the material appeared to mound up in a few discrete areas, the density did not approach that found in AA 2.2. Nearly 170 pottery sherds were collected from the area. Despite this number, part of only two vessels was represented, V 38 and 43. Conjoins for these vessels were found in adjacent areas, and one from AA 2.2 as well.

The artifact scatter yielded three projectile points, including two complete Plains Side Notch specimens. As well, three bone scraping tools were recovered. These were a complete and a broken bone flesher and a fragment of a possible bone scraper.

As in the other surrounding areas, this area was used for dumping and bone smashing.

Activity Area 2.10- This activity area consisted of a small discrete collection of a variety of artifact classes, faunal remains and fired rock. Twenty-one pottery pieces included some fragments from V 43 (some of which was recovered in AA 2.2). One small hammerstone was recovered in the debris. Despite the presence of several large fire-cracked rocks, there was no indication of any burning in the immediate area.

This area was probably a secondary discard locality, possibly coming directly from AA 2.2.

Activity Area 2.11- This area was located several m southeast of the main artifact cluster, on the edge of the assessment block. Several large bone fragments and a large chunk of fire-cracked rock, plus a small cluster of cultural debris characterized this area. Only one potsherd was found, associated with Vessel 45, most of which was found in AA 2.2. A side-notched projectile point base was recovered in the small cluster of debris.

Although somewhat separated from the other southern activity areas, this area was also apparently used for discard. The one ceramic conjoin suggests the debris source may have been AA 2.2.

SUB-BLOCK 2.3

Sub-Block 2.3 was a 5 x 8 m area bounding two major artifact scatters and at least three hearths (Figure 5.14). The artifact distributions consisted of a quantity of lithic debitage and smashed bone clusters within which were mixed many potsherds and stone and bone tools. One of these distributions covered much of the northern half of the block. The other scatter covered the southern third. Two hearths were located within one metre of one another in the southern half of the block. The partially destroyed remains of a third were exposed in the southwest corner, in an area badly disturbed by construction equipment. A large burn area containing a small amount of ash was discovered in the centre east side of the block, beside a large patch of red ochre.

Artifact recoveries, although not nearly as plentiful as those from Sub-Block 2.1, were nonetheless very significant. As shown in Table 5.8, a very large amount of lithic debris and over 100 stone tools were recovered, most in association with the hearths. The

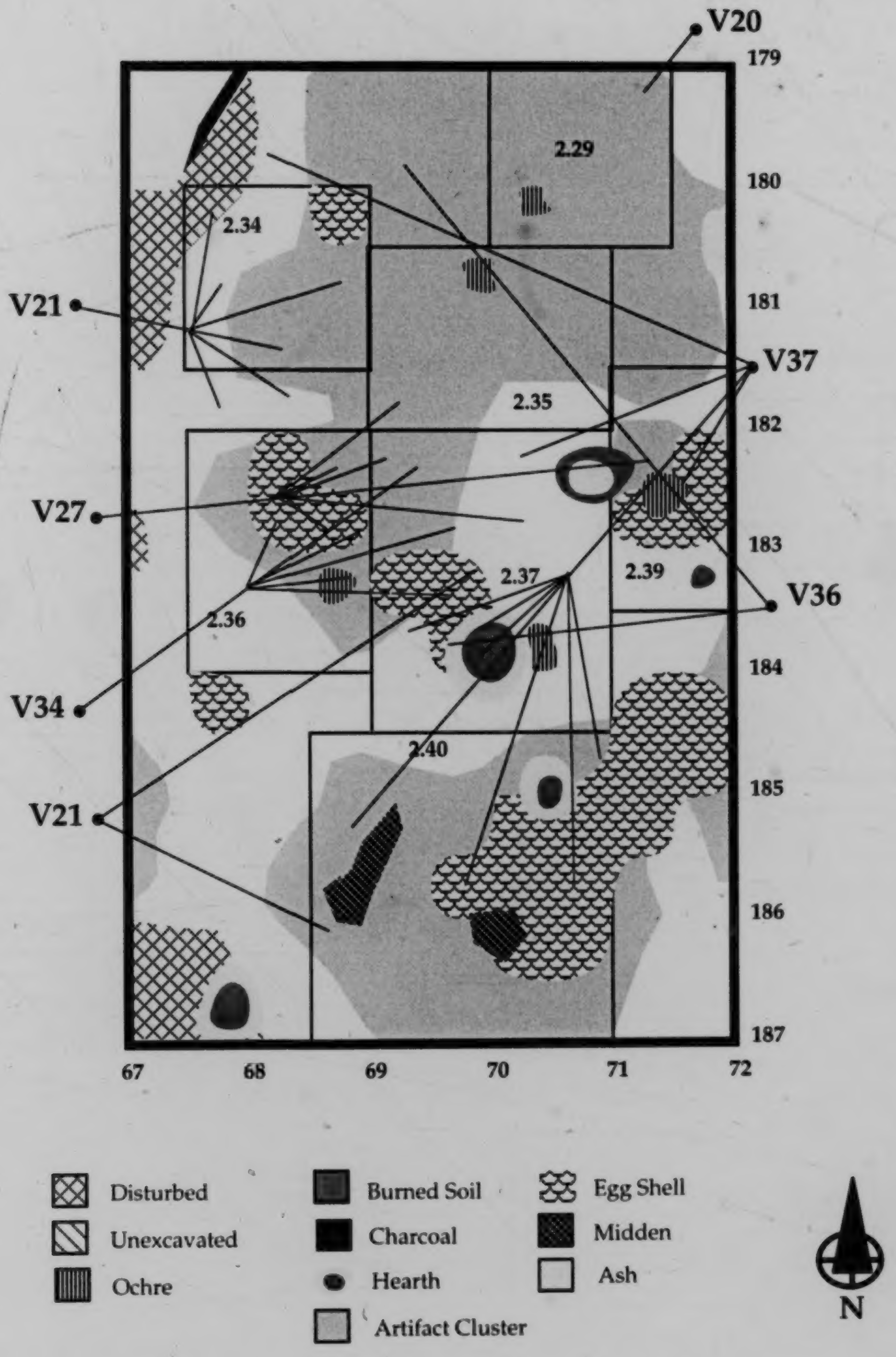


Figure 5.14. Primary features and ceramic crossmends of Sub-Block 2.3.

Vessels	6	Stone Tools	111
Sherds	776	Worked Bone	6
Ochre	82	Debitage	6,316
Clam shell	225	Microdebitage	30,025
Egg shell	1213	Cores	81
Bone (grams)	13,761	FCR (grams)	11,769

Table 5.8. Major artifact recoveries from the ceramic area of Sub-Block 2.3 (67-72 m E / 179-187 m S - Area = 40 m^2).

remains of six pottery vessels were also found. Most of these artifacts were located within eight defined activity areas (2.29, 2.34, 2.35, 2.36, 2.37, 2.38, 2.39 and 2.40.

Pottery

Nearly 800 pottery sherds were recovered from Sub-Block 2.3. A number of these pieces could be crossmended, resulting in the partial refabrication of six identifiable vessels. They were V 20, V 21, V 27, V 34, V36 and V37. Sherds from Vessel 37 were widely distributed throughout the block in several activity areas, plus a large portion outside of the sub-block to the west. Vessel 20 sherds were distributed widely outside of the sub-block, especially to the northwest. Only a few sherds were found within its defined boundaries. The remaining vessel-associated sherds were confined to Sub-Block 2.3.

Lithic Debris

Nearly 6,000 pieces of debitage were recovered throughout Sub-Block 2.3. The bulk of this material was found in Activity Areas 2.37 and 2.40. An immense quantity of microdebitage was recovered in three separate areas of the sub-block. The largest collection came from an area about 3 m in radius, centring on the large hearth in Activity Area 2.37. Two other clusters appeared in the northwest and northeast corners of the block. Cores appeared to be more uniformly distributed throughout Sub-Block 2.3 than in the case of debitage and microdebitage.

Stone and Bone Tools

Block 2.3 yielded an abundance of tools, in great variety (Figure 5.15). Only the celt class was unrepresented. The most numerous class was projectile points, most which were recovered from around the two hearths in Activity Areas 2.37 and 2.40. Bifaces were the next most abundant type of tool recovered, also occurring in unusually high frequencies in the aforementioned areas. A high proportion of these tool classes were recovered broken.

Fire-cracked Rock

Clustering of FCR was more apparent in this sub-block than in other areas of Block 2.

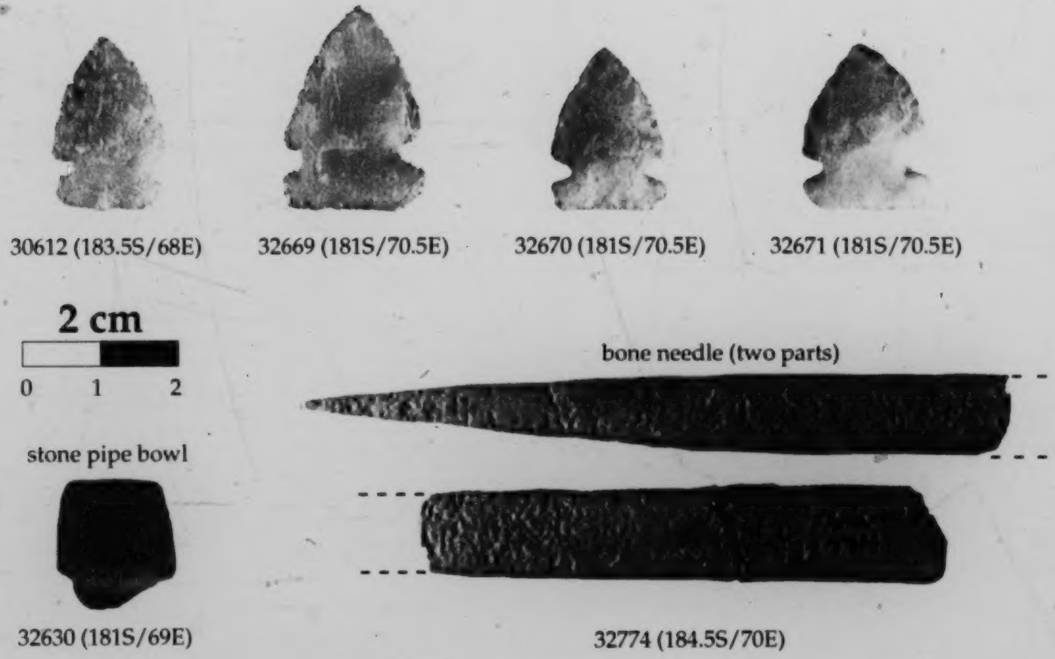


Figure 5.15. Projectile points, pipe bowl and bone needle recovered from Block 2.3.

Two significant clusters appeared in Activity Areas 2.35 and 2.36. Both areas contained a number of large rock chunks that may have been used for bone smashing. Most of nearly 12 kg of material was recovered in the north half of the block, usually in association with smashed bone. The material did not appear in noticeable clusters; most consisted of large individual chunks resting on the occupation floor unassociated with any particular fire source. Elsewhere, fired rock appeared as single chunks only.

Rare/Exotic Recoveries

A considerable quantity of ochre fragments, mollusc shell and egg shell were collected from Block 2.3. Solid ochre pieces were recovered primarily in Activity Areas 2.36 and 2.37, northwest of the large hearth. Several large ochre stains were exposed on the paleosol surface, principally near the hearths or in the centres of dense artifact scatters. Although these stains obviously contained a significant quantity of pigment, nearly all of it had been integrated into the paleosol matrix (as if it had been in liquid form at the time it was either spilled or purposely dumped) and could not be quantified. The location and character of these stains is detailed in separate activity area descriptions.

Egg shell remains were recovered in abundance, particularly around the hearths. These pieces were very small, averaging less than 6 mm in the longest dimension. None of the egg shell fragments was of sufficient size to be identified to a bird taxon.

Pieces of clam shell were less common. Nearly 100 small fragments were found in one 50 cm cell on the south edge of AA 2.36. This was the only area in which the material was found in a cluster. The clam shell appeared to have been obtained locally. No exotic shell was recovered.

A single fragment of iron was found resting on the paleosol surface at 183.5 m south, 69.5 m east, directly associated with a large hearth, in activity area 2.37. The piece was approximately 2 mm thick, 32 mm long and 22 mm wide, weighing three grams. The material was highly corroded. The piece consisted of several layers of folded metal, shaped and cut on three of its sides. In plan view the piece resembled a point preform, bearing a possible shoulder notch on one side. The piece was too poorly formed to identify its form or function conclusively, however.

Although native copper has been found on other Selkirk sites, and was a known, although apparently rare, exotic good in use in precontact times, the iron (or iron-based tin) piece found here is an anomaly. It is probable that the metal was originally an Old World import (either Western European or Asian by way of the Arctic (McCartney 1988)), and was an extremely rare material to be encountered on the middle reaches of the Saskatchewan River at the time of Bushfield West's occupation. It was probably a highly valued late precontact trade item.

Faunal Remains

Nearly 14 kg of highly fractured bone was recovered from Sub-Block 2.3. The fracturing, which was perhaps more pronounced than in other areas, made identification of specific faunal elements difficult. Nearly all of the specimens were of large or small mammals, although a significant number of bird bones were identified. Bison and beaver elements made up nearly all of the species subset .

Many of the specimens which could be aged were from adult and immature animals, the latter nearly all beaver and unspeciated rodents. One foetal bison bone was observed.

Context of Remains

This area, located in the north east portion of Block 2, bounded two major artifact scatters and three hearths (Figure 5.14). Tool recoveries were significant, and six pottery vessels were identified and associated with the area. Eight separate activity areas were defined in the block. Their content is summarized in Figure 5.16.

Activity Area Description

Activity Area 2.29 - Situated in the northeast corner of Sub-Block 2.1, this activity area contained significant quantities of all material classes, and appeared to represent a subcluster of the larger artifact scatter spreading north from the hearth areas at the centre of the block. All material was spread about on the paleosol in no particular pattern.

Non-tool lithic classes were insignificantly represented; on the other hand the area was well-represented by formed tools. In particular, a large chunk of basalt was recov-

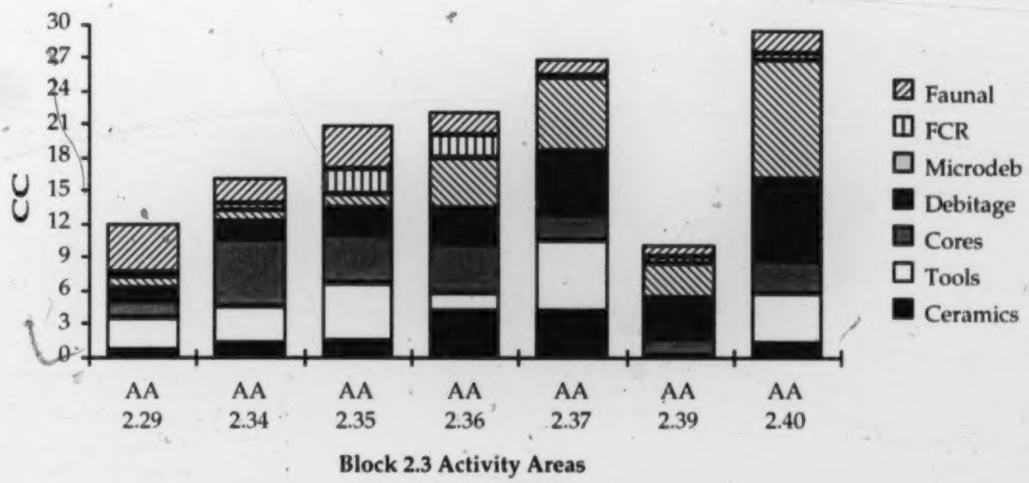


Figure 5.16. Activity Area content for Block 2.3.

ered in the debris. One face of the stone was flat and bore wear marks suggesting that it may have been used as some sort of abrader or grindstone. Also recovered was a small bone splinter with one end sharpened to form a simple awl. Fifteen pottery sherds were found in the debris scatter, including a body and shoulder section. A few of the sherds were part of Vessel 20, most of which was recovered north and west of Block 2.3.

It is difficult to determine what activities were responsible for the debris scatter in the area. Debris essentially consisted of smashed bone, flakes, the odd bit of pottery and a number of tools. The latter class was a mixed bag of scrapers, an abrader and a perforator. It is possible that there was some sort of hide processing/clothing manufacturing taking place, which would account for the awl and perhaps the scraping tools. However, the rest of the debris suggests disposal, and the broken condition of at least half of the formed tools and the crude nature of the abrader and bone awl tends to support this hypothesis. If it was a disposal area, it is probable that the debris came from the centre of Sub-Block 2.3, in the hearth areas.

Activity Area 2.34- This activity area resembled AA 2.29 in many respects. The area encompassed a sub-cluster of bone splinters and pieces within which were mixed debitage, cores, stone tools and pottery. The debris also contained a quantity of fragmented egg shell. The sub-cluster marked the northwest periphery of the general artifact scatter located in the centre of Block 2.3. There was no observable patterning to any of the artifact distributions.

Many of the 40 pottery sherds retrieved from the activity area could be crossmended to reconstruct portions of Vessel 21. Part of this vessel was also recovered in the vicinity of the hearth area in AA 2.37; one sherd was found in AA 2.40.

In summary, AA 2.34 consisted of a thick, bounded layer of debris uniformly distributed over the occupation surface. The debris contained debitage, microdebitage, exhausted cores and predominantly broken or disposable tools. Faunal remains were finely smashed, and the identifiable pieces originated from all parts of bison and beaver carcasses. A large part of a single vessel was recovered within the debris scatter. AA 2.34 apparently functioned as a disposal area. The probable source of the refuse was from the south, most likely in the vicinity of the hearth in AA 2.37. This conclusion is supported by the presence of disposed egg shell, burned faunal fragments and the crossmending of a charred sherd recovered from the hearth with remains of Vessel 21. The relatively high incidence of gnaw marks suggests that dogs may have scavenged the disposal area. It is possible that gnaw marks on the smaller pieces were of human origin, occurring prior to the bone being discarded.

Activity Area 2.35- This was yet another bounded debris cluster, abutting AA 2.29 and 2.34 on the north and northwest sides. A large cluster of fire-cracked rock was exposed on the west side, and smaller pieces of rock were scattered throughout the debris. A patch of yellow ochre was found on the centre north side, completely dissolved into the paleosol matrix, as if the material had been spilled on the ground in liquid form. Debris covered most of the activity area, except for an apparently bare patch of occupation located on the southeast edge. A small burn area containing some ash was encountered adjacent to this spot in AA 2.37 and 2.39. This feature is described in detail elsewhere (AA 2.39).

Formed tools were recovered throughout the area in relative abundance. Three of the four projectile points were complete Plains Side Notch specimens. Two hammerstones were part of the tool collection. Although not tabulated with the rest of the tools from this area (being just outside of the defined activity boundary), a tiny fragment of a polished slate pipe bowl was recovered from the debris about 50 cm southeast of the ochre spill (Figure 5.15). Part of the bowl profile from the rim to below the sharply rounded lower shoulder was represented. Most of the base and all of the stem was missing. The pipe was quite small, the orifice diameter being little more than one cm.

Faunal remains were generally highly smashed, except for a few anomalous whole elements. A complete mandible half from a lynx was identified. The mating mandible section was recovered nearby in AA 2.39. Pottery was recovered in several discrete clusters in the area, particularly on the west and south edges, and in a single cell in the northeast corner. A few sherds were conjoinable to Vessel 27, in AA 2.36.

Activity Area 2.35 bore many of the characteristics of the previously discussed areas. The material was recovered in an amorphous scatter, indicating that some sort of disposal was taking place. Faunal remains appeared to be of the type associated with disposal: most of the bison remains had been gnawed (probably by a carnivore), and inedible teeth and mandible fragments comprised a significant proportion of the identifiable faunal assemblage. The proportional combinations of debitage (primarily of Swan River chert), microdebitage and cores indicates possible core reduction activity, which would produce flakes and a small amount of micro-shatter. However, this debris could also have been produced elsewhere and disposed of in the area. The small collection of diverse lithic materials supports the latter hypothesis. A large number of tools were found in the debris. Most of the well-formed tools were complete and unbroken, including three of the four points. It is possible that they may have been mixed in with lithic and bone debris from elsewhere and tossed. The presence of the spilled ochre and the discarded pipe bowl fragment also supports the idea of the area being a refuse dump. The two hammerstones may have been used for bone smashing in the area, but just as easily may have been placed in the area as "de facto" refuse.

There is some evidence that some of the refuse found in this area came from the vicinity of AA 2.39, since the mate of a lynx mandible came from there. Also, a small ochre spill (suggesting the use of liquefied paint) was recovered in AA 2.35, and a much larger one of the same material found in AA 2.39.

Activity Area 2.36- This activity area was situated less than two metres west of the large central hearth. It consisted of another bounded scatter of bone splinters, debitage, pot sherds, egg shells and some fire-cracked rock. A small patch of ochre was exposed within the debris.

Lithic remains were especially abundant. Flakes were not amorphously strewn within the general artifact scatter. Several discrete clusters of both debitage and microdebitage were noted, during collection and during subsequent cluster analysis. A significant quantity of debitage was composed of a greyish-green sandstone material. This lithic material was commonly used to make celts found on Bushfield West. These flakes clustered in the north-central portion of the activity area, in several cells. Over 50% of the microdebitage, recovered in profuse quantities, was composed of the same material, particularly in one cell in the northeast corner of the activity area. Although 12 cores were recovered, no cores of this material were found.

AA 2.36 yielded only a few tools. A Plains Side-notched point and a retouched flake were found, both complete. A basalt hammerstone and a large notched slab were discovered mixed in with the the cluster of celt flakes. The former was a small, poorly formed basalt rock with percussion marks around its circumference. It apparently had been used for core reduction. The slab was a large flat rectangular rock (19 x 13 x 5 cm) with a crudely flaked bit and two large notches removed from each side of the slab centre. The notches were presumably served in hafting a large handle onto the tool, making it into a crude axe or maul. The slab was also pecked on both sides of its flat surface suggesting it may also have been used as an anvil. A fragment of a bone tool was recovered adjacent to a cluster of microdebitage. The bit was well-worn and slightly flattened, coming to a blunt point. It resembled a flint-knapping pressure flaker.

Nearly 175 pot sherds were found in the debris scatter of Activity Area 2.36. A number were crossmended with Vessels 27 and 34. Vessel 27 sherds were found tightly clustered in the northeast corner of the activity area, and adjacent corners in AA 2.35 and 2.37.

The predominant activities taking place in AA 2.36 appear to have been stone knapping and perhaps some bone smashing. The evidence for stone working is based upon the association of discrete collections of debitage and microdebitage with a small hammerstone and a bone pressure flaker. Based on the debitage remains, at least one celt was manufactured. Despite the lack of broken or incompletely finished lithic tools, it is probable that points, knives and scrapers were also being made, or at least resharpened. It appears that bone was being broken up, judging by the faunal debris scattered about, and the presence of the apparently discarded notched slab chopper. There also seems to have been some refuse discarded in the area, as suggested by the presence of broken pottery, egg shell and pieces of burned bone in the debris, and the ochre cluster discovered on the living floor. Most of this material probably probably came from adjacent activity area 2.37.

Activity Area 2.37- This was one of the largest activity areas defined in Sub-Block 2.3, containing high densities of tools, debitage and microdebitage. Despite this productivity, the area appeared to be relatively free of debris when excavated, except in the northwest corner and along the west edge. This illusion was supported primarily by the relative absence of faunal debris on the area's living floor. The central feature was a large hearth located in the area's south-centre. The fireplace consisted of a thick red soil lens at least 70 cm in diameter, overlain by a 3 cm layer of ash. The ash contained calcined bone, lithic debris and potsherds. A great deal of cultural material was recovered north and south of the feature. This debris consisted of all kinds of artifacts. Most significant were formed tools, egg shell, and a piece of iron, discovered on the northwest edge of the hearth. The area immediately surrounding the hearth was relatively sterile. Northeast of this hearth was another burn area, containing a small amount of ash. It appeared to be a satellite hearth. The intervening area between the features was unusually free of debris. A number of small paint flecks were discovered east of the central hearth, in the middle of a debitage cluster. They appear to have been the remains of a powdered ochre cluster.

Thirty-four formed tools were collected, primarily from the two areas north and south of the hearth, and in the hearth ash. The ten points were nearly all represented by tips, bases or split body sections, probably the result of knapping errors. Four pieces were recovered from the central hearth ash. Only one of six bifaces was retrieved unbroken. Three of five scrapers were represented by largely unidentifiable fragments. One complete endscraper was found. Five of eight retouched flakes were found fractured.

A possible pecking stone fragment was found in the debris north of the hearth and a very large anvil stone was exposed overlying the hearth ash. The anvil may have been used as a chopper since it was crudely chipped to an edge on one end. A flat sandstone plate resembling an abrader found in AA 2.39 was recovered in the debris north of the hearth. Part of one face had been ground smooth, although the surface was not as finely polished as the abrader from the other activity area. A long, thin, well-made bone needle was recovered just west of the satellite hearth in the northeast corner of the activity area, in an area in which the living floor was relatively uncluttered with debris. Another bone tool, a possible scraper or flaking tool fragment, was found on the west side of the hearth, in another relatively uncluttered area.

AA 2.37 contained nearly 300 pot sherds. These sherds crossmended to five vessels recognized in the block (Vessels 21, 27, 34, 36 and 37). Sherds from Vessel 21 and 36 were found directly in hearth ash. Although pieces of Vessel 37 were scattered all over the block, remains of the other vessels seem for the most part to have ended up on the debris piles located northeast of the hearth.

This activity area seems to have served as a multi-purpose living area and workshop. The central hearth, which contained calcined bone and broken pottery fragments, was probably used for roasting and boiling. Smashed bone fragments and egg shell strewn to the northwest of the fire (and within it) appear to have been disposal remnants of some sort of bone processing and general cooking activity. Potsherd distributions suggest that vessels were probably used and broken in the area. There may have been some ochre preparation, as alluded to by the presence of pigment remains and a small grinding implement. Recovery of the piece of iron on the northwest edge of the central hearth seems to indicate that the occupants were involved in some kind of exotic trade network, although the trading may not have taken place in this activity area.

The dominant activity seems to have been tool making, however, as demonstrated by the recovery of great quantities of debitage and microdebitage and a very high proportion of broken tools. Most of this activity seems to have been restricted to areas to the west, northwest and directly south of the hearth. The northeast side of the hearth was quite clean. It was in this area that the bone needle was found, plus an unbroken retouched flake and endscraper. It may have been used for less messy activities such as hide working or even sleeping. Lack of significant identifiable faunal recoveries suggests that animal butchering was not a prominent activity in any part of this activity area.

Activity Area 2.38- A distinctly elongated accumulation of artifacts passing through this otherwise sterile area suggested that the cluster was composed of debris raked from the surrounding area into a small windrow. Within the debris, seven tools were recovered, including two complete projectile points, a biface preform and a retouched flake. Sixteen pottery sherds and a large quantity of egg shell were also recovered in the debris windrow

The activity area appears to reflect some sort of purposeful debris dumping or piling activity rather than an area of gradual artifact accumulation. Although pottery could not be crossmended to any identified vessel, the presence of discarded egg shell may be part of the scatter which apparently spread from AA 2.40.

Activity Area 2.39- Activity area 2.39 encompassed a small, bounded debris scatter located on the east side of a small burn patch containing artifact-laden ash. The feature, most of which was situated in the northeast corner of AA 2.37, was apparently a small hearth. The small volume of ash contained calcined bone and flakes. A small amount of fire-cracked rock was scattered to the east in the artifact distribution. In the centre of the debris the paleosol was discoloured by a 30 cm diameter stain of red ochre. The pigment was integrated thoroughly into the upper two cm of the paleosol in much the same manner as the yellow ochre in AA 2.35. The debris contained debitage, microdebitage, pieces of pottery and a quantity of splintered bone. A number of egg shell fragments were also recovered around the ochre patch. Formed tools were mixed in with the debris.

Seven formed tools were recovered. Among them, two tiny abraders were identified. One was a flat sandstone plate about 5 cm on a side and approximately 0.5 cm thick. This object had been polished marble-smooth in the middle and obviously had served as either a sharpening stone or possibly a very small metate. A tiny round hole had been drilled several mm into the plate surface, but did not penetrate to the other side. The second item was a fragment of a similar type of plate. It bore a highly worn face as well. The two pieces did not crossmend with one another and appeared to be of separate origin. Neither of the items exhibited any kind of stain. The single bone item was a small, flat round shell blank. It is possible that, had this piece been completed, it would have been drilled through and strung as a decorative bead.

Sixteen pottery sherds were found in the debris. A large section of Vessel 37 was recovered in the vicinity of the ochre stain and lithic debris. A charred rim sherd from Vessel 27 was found within the hearth.

The character of the debris scatter in AA 2.39 is somewhat different than that of other areas peripheral to the large hearth at the centre of Block 2.3. Debitage and microdebitage were exposed in several tight clusters, not part of a homogeneous artifact distribution as was found in AA 2.29, 2.34 and 2.35. This discrete lithic patterning, plus the presence of a number of broken and unfinished tools suggest that tool manufacturing took place. A bead blank was recovered, implying that shell working was also undertaken.

Most intriguing was the large ochre spill. Two tiny grinding implements were found adjacent to the stain. Though fragmented, their finely polished character indicates that they were used for intensive, small-scale grinding, as would be expected if small pieces of ochre were to be pulverized for suspension in liquid. The large section of Vessel 37 recovered in the activity area appeared to be stained with ochre, especially on the interior. Since this vessel did not appear to have been suitable for cooking (the paste was poorly consolidated) it may have been used as a container for mixing ochre to make liquefied paint. Liquefaction of paint suggests imminent usage; therefore it seems probable that paint was being applied as well as manufactured.

This area, containing the small satellite hearth, appears to have been reserved for specialized tasks. These included stone and bone (shell) working, paint making and using, plus some roasting. Use of pottery vessels over a fire is also indicated, as suggested by the recovery of a large pot sherd for the satellite hearth. The vessel was apparently discarded to the west, in activity areas 2.37 and 2.35. The latter area appears to have been the focus for byproducts coming from activity area 2.39. It seems evident that the pipe bowl fragment found in AA 2.35 came from the vicinity of the satellite hearth. Thus, smoking-related activities and affiliated interaction behaviour are implied, as well.

Activity Area 2.40- This activity area was incorporated by the southern third of Block 2.3. It was strewn with finely broken bone fragments in the north half, and larger pieces of bone in the south half. Pottery fragments were recovered in several discrete clusters. Lithic debitage was strewn throughout the entire area, exposed in quite compact clusters in a few areas. Several small middens were noted; one occurred in a natural trough in the paleosol in the west half of the activity area. It was filled with a only few splinters of bone but significant quantities of debitage and pottery. A second small midden occurred in the area centre, in a small 10 cm deep natural hollow; it contained several bison mandible sections, bison teeth, a cluster of potsherds and some debitage.

A second small satellite hearth was exposed in the northeast corner of the area. It much resembled the hearth discovered in the northeast corner of AA 2.37. The feature consisted of an oval patch of burned soil approximately 50 cm in diameter, overlain by a very thick (approximately six cm) layer of ash. The ash contained burned bone and flakes. A significant quantity of egg shell was collected on the south and east sides of the feature, part of the distribution surrounding the small central midden.

Debitage and microdebitage dominated the assemblage from this area. Although flakes, shatter and microflakes appeared to cluster in a few places when the paleosol was exposed, preliminary distribution studies indicated that little significant clustering occurred in the area.

Of the 30 tools recovered from AA 2.40, 25 were projectile points and bifaces. Every one of the 12 points was recovered broken or incomplete. Ten of the 13 bifaces were broken or incomplete as well. Three unifaces (two endscrapers and a sidescraper) and two retouched flakes were recovered unbroken. No other tools were recovered directly within the boundary defined for AA 2.40; however, a small elongated pecking stone was retrieved on the edge of the debris distribution just beyond the southeast corner of the activity area. Extensively pitted on both ends, the tool was probably a flint-knapping billet. No bone tools were recovered in the area.

Of the faunal remains, a high proportion of rodent phalanges (probably beaver) were identified. Nearly half of the identifiable specimens had been charred by fire. All of the burned beaver bone in the area came from the satellite hearth.

A number of potsherds were recovered from the block. The majority could not be crossmended to any particular vessel, but a few pieces could be associated with one recognizable pot within the activity area. This was vessel 37, which was spread throughout the block; but most of it was found in AA 2.37. One piece of Vessel 21, most of which was found in a bounded area in AA 2.34 , was recovered just outside of the activity area in the midden located in the area's west side.

Like AA 2.37, AA 2.40 was probably a multiple activity work and disposal area. Tool making was the most significant undertaking, at least in terms of waste generated. Flakes were being struck off cores and then manufactured primarily into bifaces and projectile points. The vast amount of microdebitage created attests to the intensity of the tool manufacturing and core reduction process, in which there were apparently many knapping failures, particularly of projectile points. The tool refinishing appeared to take place in the centre portion of the activity area, west of the small hearth. Immediately beside the hearth a quantity of egg shell was recovered, plus a number of intact tools. In fact, most of the unbroken knives, plus the scrapers and retouched flakes came from that area. Hide preparation and working may have taken place in its vicinity, while knapping was restricted to areas west and north of the small fireplace.

The area around the hearth did not contain much debitage, but it did contain bone fragments, many which proved to be beaver phalanges. This small hearth may have been employed to roast more delicate meat (such as beaver paws) which could not bear the intense heat that would have been radiated by the larger hearth located to the north. Egg shell was also recovered in great quantities around this fireplace, suggesting that the eastern part of the area was also used for cooking.

There may have been some intentional dumping in the activity area. Natural depressions in the living floor may have been leveled out by filling them with debris, a process which would account for the midden-like artifact clusters on the west side and centre. Also, the south edge of the area was apparently chosen as dumping spot for large pieces of bone which were not intensively smashed.

BLOCK 3

Block 3 was situated approximately 50 m east of the western cliff edge of Bushfield Flat, nearly 70 m from the Saskatchewan River. The block's archaeological component was discovered during the test assessment program undertaken in the fall of 1982. At that time, several productive pits indicated that a significant cultural occupation existed in the vicinity. More intensive testing, however, failed to intercept the suspected dense archaeological deposits. Rather than discontinue work in the locality, a magnetic survey was implemented in an attempt to locate potential archaeological features buried beneath the ground surface (Gibson 1986c). During the survey, six significant magnetic anomalies were detected. Each of these was scanned with a metal detector to eliminate spurious interference caused by metal, and then probed with a soil coring device. Soil cores suggested that at least one major fire hearth was represented in the block, plus at least one cluster of fired rock located a number of metres away from the hearth.

Other natural features of lesser significance included numerous burn spots on the paleosol, and remnant charred roots and stumps which were found to rest on and within the stratum. Most of the burn spots appeared to have been associated with root burning. The roots and stumps suggest that the block, when occupied, was at least partially forested. Their charred nature also suggests that parts of Bushfield Flat were subjected to a severe fire prior to the living floor being buried.

Significant natural and cultural features, and artifact distributions for the block are shown in Figure 5.17. Defined activity areas are shown in Figure 5.18. Although most of Block 3 was considered relatively unproductive, certain portions of the locality produced great quantities of many kinds of materials. Artifact recoveries for the entire block are summarized elsewhere (Gibson 1994); for this study only those Activity Areas (3.3-3.8 and 3.10) which yielded significant ceramic recoveries are addressed. Table 5.9 shows the artifact recoveries for the entire block.

Vessels	4	Stone Tools	42
Sherds	736	Worked Bone	4
Ochre	90	Debitage	2,241
Clam shell	46	Microdebitage	9,959
Egg shell	8	Cores	51
Bone (grams)	7,510	FCR (grams)	5,279

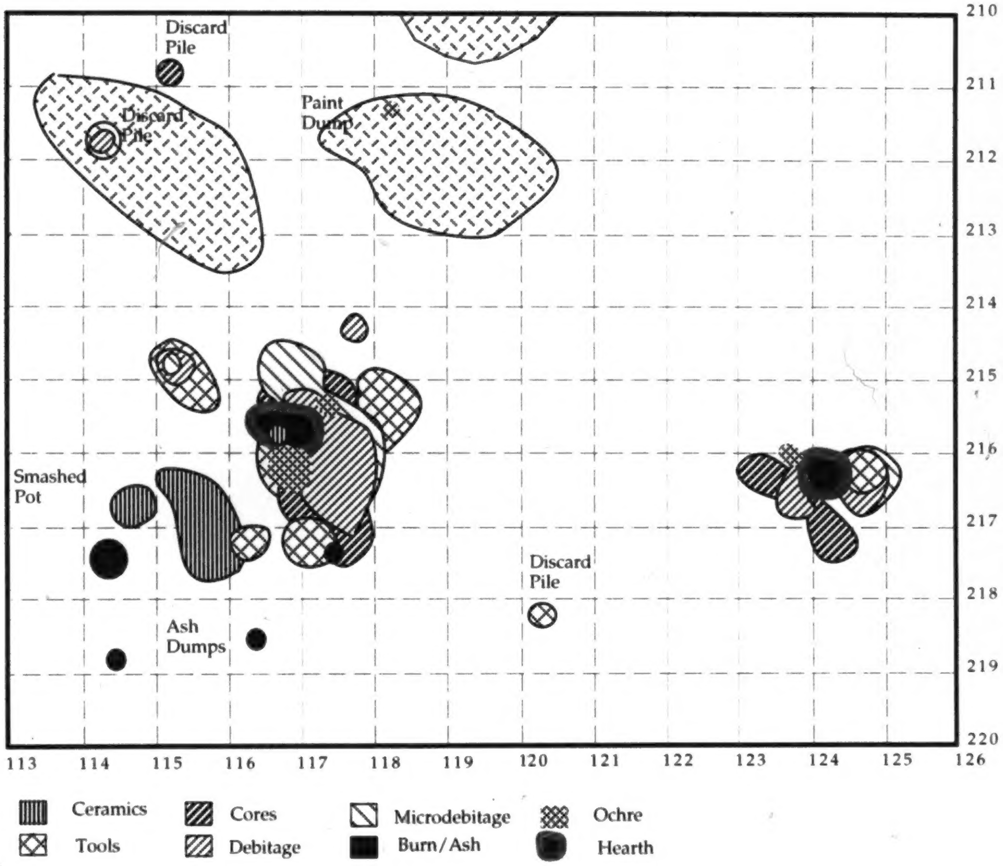
Table 5.9. Major artifact recoveries from Block 3 (106-126 m E / 200-210 m S - Area = 200m²).

Pottery

Two nearly complete vessels (V 1 and V 8) and two pots represented by rim and neck sherds (V 14 and V 23) were recovered from Block 3. The former two vessels were found smashed *in situ*, although parts of Vessel 1 were found clustered in two other areas as well. The largely whole pots were associated with the cluster of activity areas around the largest hearth in the block (AA 3.4-3.8). Many body sherds spatially associated with Vessels 1 and 8 could not be mended to any particular vessel. They may be part of the remains of Vessel 14 or of some other vessel not represented by rim portions. Vessel 23, a rim sherd fragment, was isolated in activity area 3.10 and could not be associated with the three other identified pots. The distribution of vessel parts is shown in Figure 5.19.

Lithic Debris

There appeared to be an ubiquitous scatter of stone flakes throughout the living floor of Block 3. Almost every square metre produced at least one flake. Significant quantities of debitage, as interpreted through the Concentration Statistic, appeared only in a few



Artifact outlines based on CCs greater than 1.5.

Figure 5.17. Plan view of significant features and interpreted artifact distributions within Block 3. Note that the area between 110 -113 and126-130 East, 210-220 South is not shown because of the absence of features, athough it was almost entirely excavated. See Figure 5.18 for a fuller explanation of artifact distributions.

areas of the block, however. Unlike the debitage class, microdebitage was found in only three areas of Block 3. Most was concentrated in a few 50 cm squares, in great frequency. The appearance of the class indicates a local area of intense flint knapping, or an area in which flint knapping debris was discarded. Not surprisingly, the spatial distribution of of the 51 cores recovered in Block 3 closely parallels that of debitage concentration, but for a few exceptions.

Stone and Bone Tools

Several important, and relatively rare, stone tools were recovered from this block. The most intriguing items were a pair of ground and pecked mortars recovered in Activity

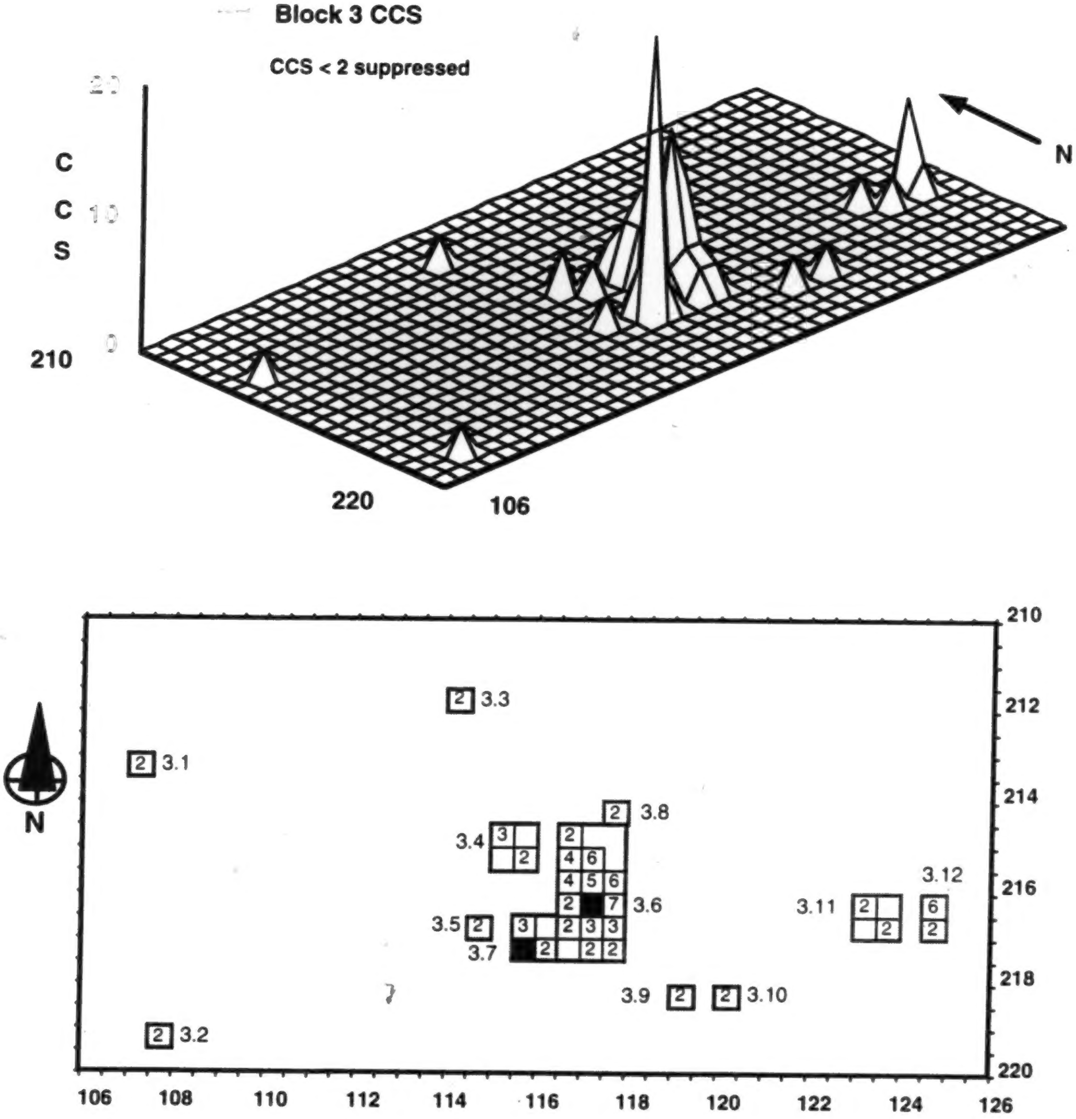


Figure 5.18. Summary of activity areas identified in Block 3, using Cummulative Concentration Coefficient.

Area 3.4. They bore stains on their grinding surfaces suggesting they were used to manufacture ochre. Use wear on each artifact suggests that the two were used together. The only diagnostic projectile points were two nearly complete Plains Side Notch specimens. A complete celt was also recovered. Selected tools are shown in Figure 5.20.

Fire-cracked Rock

Despite the presence of two hearths in Block 3, and widespread evidence of intensive

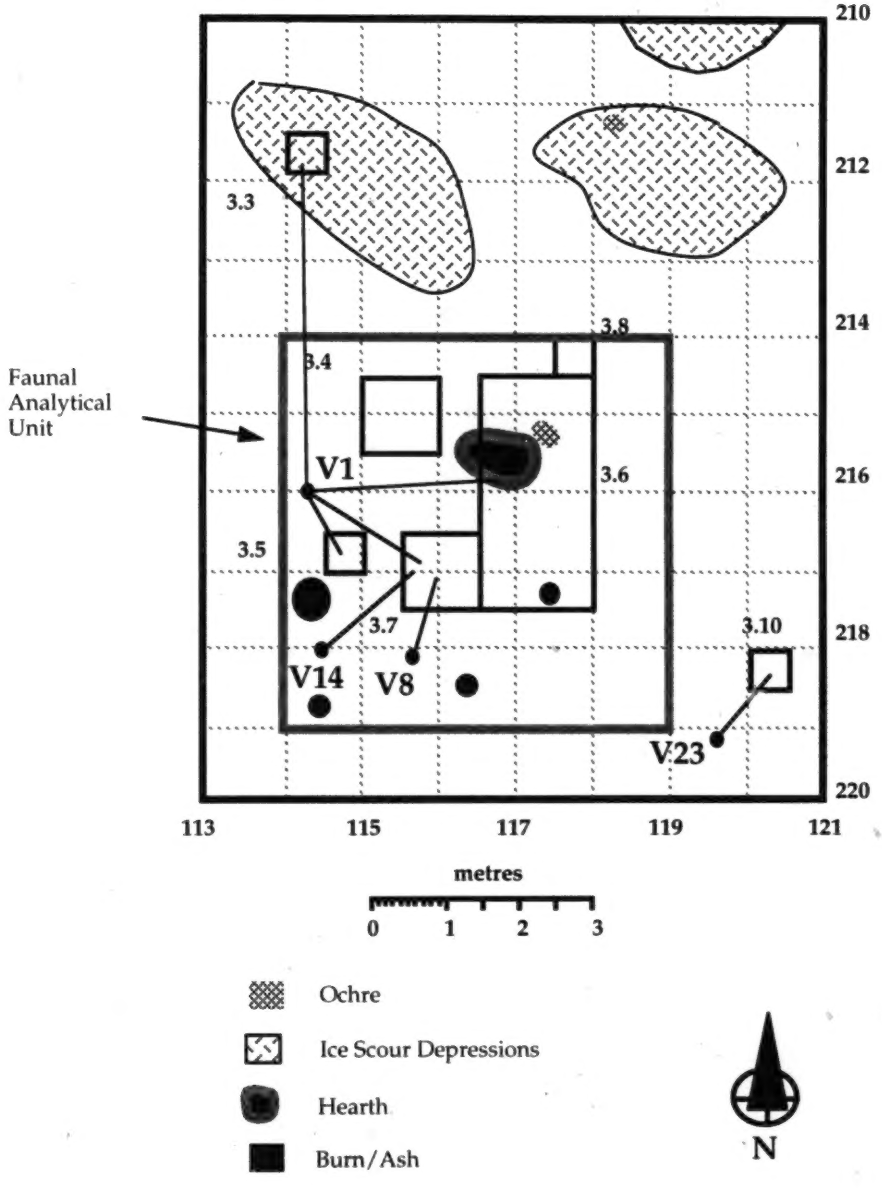


Figure 5.19. Location of ceramic recoveries within Block 3.

bone processing for consumption, only a small quantity (just over five kg) of FCR was recovered. This rock was almost all associated with hearths. It was all in very friable condition. It is apparent that the more labour-intensive activities such as animal dismemberment, bone smashing and bone de-greasing took place beyond the area represented by Block 3. This situation may account for the lack of FCR, since this artifact class is nor-

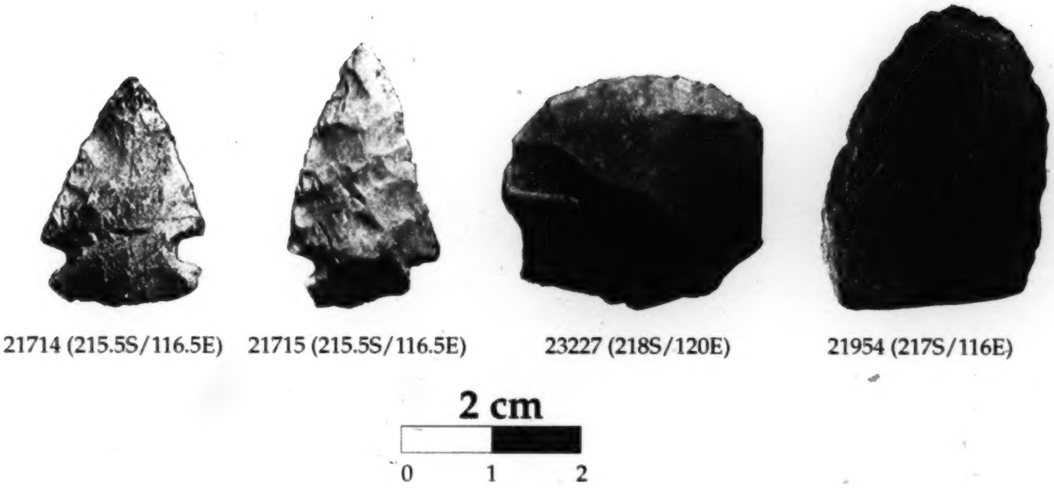

21714 (215.5S/116.5E) 21715 (215.5S/116.5E) 23227 (218S/120E) 21954 (217S/116E)

Figure 5.20. Projectile points, end scraper and celt from Block 3.

mally manifested in areas in which bone boiling and bone processing take place.

Rare/Exotic Recoveries

In this area ochre was difficult to quantify because of its fragmented nature and its tendency to blend in with the paleosol matrix. The frequency reported in Table 5.9 represents the number of fragments recovered during excavation. What is not represented is the amount encountered as stains on the living floor which could not be documented except through mapping and photography.

Two significant ochre stains were found in the ceramic section of Block 3. One was exposed on the north side of an ice push feature at 211 m south, 118 m east, northwest quarter. It was a 10 cm diameter stain which penetrated about half a centimetre into the paleosol. A second, much larger paint stain was found centring at 216 south, 117 east, covering most of the 50 cm squares surrounding that point. This feature, nearly 75 cm in diameter, was associated with a large hearth and many artifacts. In places, the red paint penetrated 1 to 2 cm into the paleosol, staining a few flakes and bone fragments found within its extent. A large rock weighing nearly 20 kg intruded into the northwest edge of the paint stain. Although it did not appear to bear any grinding surface, the top of the rock was smudged with red ochre.

Almost all of the nearly 50 fragments of clam shell found in the ceramic section of Block 3 were recovered in the area of the largest hearth, around activity areas 3.4 to 3.7. No shell fragments appeared to bear working edges or were modified in any manner.

Eight fragments of egg shell were found in association with activity areas 3.4 to 3.7, near the large hearth in that area. Although undiagnostic as to species, they do suggest that the area was occupied in the mid to late spring, when bird nesting takes place in the Nipawin area (McKeand 1995:243).

Faunal Remains

The majority of this material was recovered in the vicinity of the large hearth located at the centre of the block, from which most of the ceramics were recovered. The bone was recovered in a highly fragmented state, permitting only 116 pieces to be identified. This fragmentation was not a taphonomic phenomenon: almost all of the bone had been purposely broken up at the time of deposition.

Fragments from elk, bison, wolf, beaver, goose, duck and grouse were identified. Many of the identifiable bone fragments could not be aged. Most appeared to be from animals of the adult or young adult stage of development, although a significant number of bones were judged to be of immature age. No foetal bones were identified. The two most significant species represented in the identifiable collection were bison and beaver.

Only three activity areas produced identifiable faunal remains. In fact, identifiable faunal material from this block did not correlate specifically with any defined activity area boundary, although a general correlation could be made with Activity Areas 3.4 to 3.8. Consequently, a Faunal Analytical Unit (FAU) was arbitrarily defined, encompassing the area around these Activity Area clusters. Its defined boundary is shown in Figure 5.19.

Context of Remains

Block 3 was located in a relatively isolated part of Bushfield West, in an area interpreted to have been forest at the time of occupation. A large part of the block was nearly sterile of artifacts, except for two areas in which dense clusters of cultural material and hearth features indicated that significant activities once took place. One of these areas yielded impressive pottery remains, in combination with artifacts and features (Figure 5.17). These remains were found in seven activity areas, whose content are summarized in Figure 5.21.

Activity Area Description

Seven activity areas were defined around a large hearth and ochre stain exposed in the middle of Block 3. The relative proximity of five of these areas suggests that the locality was the focus of many activities normally associated with a temporary residence. The previously defined Faunal Analytical Unit completely encompasses these areas, serving as a useful arbitrary boundary for evaluating the clusters as a combined unit, or Activity Complex.

Activity Area 3.3- This was an area defined by the contents of a single 50 cm square, in which quantities of microdebitage and debitage (composed entirely of brown chal-

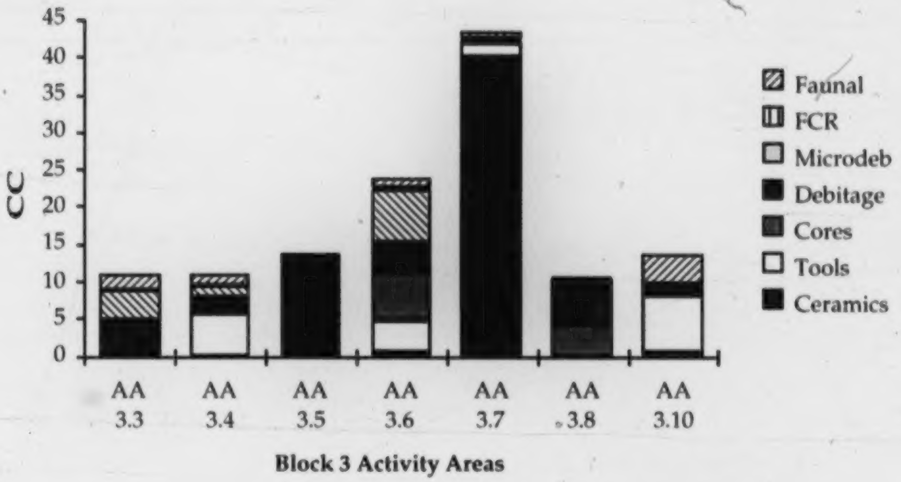


Figure 5.21. Activity Area content for the ceramic portions of Block 3.

cedony) were found in a 50 cm diameter cluster at the bottom of a 1 x 3 m ice push depression. No tools or cores were present. The very tight dispersal pattern of the debitage fragments suggests that the material had been dumped in place as a single event, rather than being deposited randomly in the course of flint knapping. Mixed in with this lithic material was a matrix of charred and pulverized bone fragments. Although no ash was found mixed in with the bone and debitage, the artifact deposit may represent remains scooped out of a nearby hearth.

One metre southeast of the cluster a collection of pottery sherds was exposed, outside the ice push feature. This sherd cluster was reconstructed in the laboratory and proved to be part of the base of Vessel 1, the majority of which was recovered in Activity Area 3.7. A large body sherd was recovered one metre to the north of this material, bearing a fabric impression resembling the reconstructed sherds.

It is probable that the ice push depression was the focal point of some sort of refuse disposal. The ceramic crossmend suggests that the hypothetical hearth debris may have some association with the multiple activity areas located to the south.

Activity Area 3.4- Located northwest of the hearth, this square metre of area contained six stone tools, a quantity of debitage and microdebitage, a small fragment of FCR and many tiny fragments of bone. Two mortar-like grinding stones were found *in situ* within 50 cm of one another. The ground edge of one artifact appears to fit within the groove of the other. Both bore ochre stains when removed, indicating the two were used in conjunction with one another, probably to make ochre pigment.

Artifactual evidence suggests that the most significant activity that took place in AA 3.4 was discard. There was a general lack of significant faunal remains to indicate bone processing, apart from consumption and discard of inedible pieces. The absence of cores suggests that primary stone knapping did not take place in the activity area. Similarly, there was little evidence of stone tool making. Though tools may have been retouched there, unifacial scrapers found in the scatter of debitage suggest that they were part of a general discard process in which waste flakes were being tossed away from the hearth. Significantly, no ochre stains were observed anywhere in the area even though two ochre grinding implements were discovered. Apparently, the bulky tools were tossed into the area after use, and not thought of sufficient use to warrant being curated after the living area was abandoned.

Activity Area 3.5- Activity area 3.5 consisted of 49 pot sherds broken in place, representing various portions of Vessel 1, and a number of unmended sherds which may be associated with other vessels from the general block area.

Activity Area 3.6- A vast and varied number of artifacts were recovered from this area, located immediately north, south and east of a large hearth remnant. The hearth consisted of a compacted layer of ash forming a 60 cm oval-shaped feature. The ash contained a large quantity of blackened and calcined bone, lithic fragments, pottery sherds and pottery spalls. The hearth remnant was overlain to some degree by lithic debitage, some fire-cracked rock and a few large bone fragments. A large round rock, exhibiting smudges of ochre, bordered its west edge. It may have served as a grindstone. Several accumulations of orange-red ochre were collected on the north and south edge of the hearth feature. The southern ochre stain actually appeared to be some sort of spill or dump having a radius of at least 75 cm diameter.

Very little pottery was recovered from the activity area. What was retrieved consisted of miscellaneous sherds scattered about in no particular cluster. The only significant accumulation of sherds occurred in the hearth area. There, fragments of Vessel 1 were found, including a section of the rim. This distribution suggests that the vessel cracked or broke during use. Most of the remains were apparently tossed away from the hearth into other activity areas.

Bordering the hearth, and surrounding or intermingling with the ochre features, were a number of debitage and microdebitage clusters, located primarily southeast of the hearth. Microdebitage appeared to cluster in two areas; on the north periphery of the hearth remnant and a larger area on the east and south side.

Identifiable faunal remains were dominated by representative pieces of beaver, bison and undifferentiated ungulates. With specific reference to bison and beaver remains recovered in the area, several observations are pertinent. Bison remains consisted of appendicular parts only, while beaver remains comprised representative portions of all parts of the animal. This pattern suggests that only certain parts of bison, notably the limbs, were processed/consumed in the area. In contrast, entire beaver carcasses were processed in the hearth and work area. Not surprisingly, all of the burned beaver remains were recovered in the only activity area harbouring hearth remains. The fact that none of the bison remains were burned may reflect a different cooking process: bison meat (encasing bone) may have been boiled and consumed while beaver may have been at least partially roasted over the fire. Over half of the beaver remains from the area were of one or more immature individuals. This pattern may suggest that immature (i.e. smaller) beaver were roasted, while larger animals were boiled.

Activity Area 3.6 bears all of the attributes suggestive of a multi-purpose residence area. A number of different activities apparently took place. These activities revolved around stone tool making, food preparation and consumption and ceremonial activity. There is no indication of dumping, as in other activity areas. Tool making appears to have involved a full range of tool manufacturing stages, from primary stone reduction from cores through finishing of preform blanks into final products. The vast quantity of microdebitage attests to the tool refinishing, and the great number of broken tools seems to support this deduction.

Activity Area 3.7- This activity area contained a vast quantity of ceramics and only a small quantity of other remains. Portions of three vessels were recovered in the area. Vessel 14, represented by a large section of rim and neck, was represented nowhere else in the entire block. Vessel 8 was found to be entirely smashed in place in the square metre area. Portions of Vessel 1, found in at least three other areas of the block, were found in this area.

Activity Area 3.7 appears to have been used for discard. Most of the remains may have come from the hearth area in AA 3.6, considering the crossmends made with Vessel 1. The nature of the discard pile strongly resembles that of AA 3.10.

Activity Area 3.8- This small 50 cm square area contained over 80 pieces of debitage, a few pieces of microdebitage and a single core. It is possible that the core was reduced in the area, despite relative lack of microdebitage. Knapping of other materials is also evident from the variety of materials represented in the lithic cluster. Lack of significant microdebitage suggests that no tool manufacturing or resharpening took place in the area.

Activity Area 3.10- Activity Area 3.10 contained a variety of remains, considering its small size. Lithic recoveries included two Swan River chert scrapers and 20 flakes composed primarily of the same material. Only two ceramic fragments were found, one which represented Vessel 23.

The limited distribution of such a diverse artifact assemblage within a single 50 cm square suggests that it was a dump. This hypothesis is supported by the minuscule remains of Vessel 23, which indicates that most of the pot was discarded elsewhere. The material probably did not originate in the activity cluster described above, since Vessel 23 could not be crossmended with other vessels found in the area. It is possible that the source of the artifact deposit may have been located south of Block 3.

BLOCK 5

During the 1982 assessment operation on Bushfield West, a large quantity of pottery was recovered from a test hole located at grid coordinates 332 south, 78 east, within the occupation paleosol. The 50 cm^2 area was expanded and much of a large pottery vessel (V 5) was removed from a single metre square. The pottery remains were reconstructed and analyzed by Dr. Margaret Hanna following the field work (Hanna 1983: 84). Her analysis suggested that the vessel had never been used after it was manufactured, and in fact bore all the characteristics of a "waster," that is, a pot which had broken during the firing process and been discarded. Since wasters are commonly tossed aside after firing, Hanna suggested that the pottery firing hearth may have been located within a few metres of the pottery recovery.

The following season the area north and west of the recovery unit was opened up. The plough zone and overburden sterile sand were removed by shovel and trowel and discarded. A discontinuous layer of redeposited sand was encountered during exposure of the paleosol. In some parts of the block this deposit was nearly 30 cm thick, particularly in areas in which the paleosol dipped down into a hollow formed by ice gouging; the sandy material did not contain artifacts. Several additional sherd clusters were exposed, plus a few articulated ungulate carpals. Burned root remnants were found within the paleosol, but no evidence of a fire hearth. Much of the pottery from the expanded excavation was crossmended to Vessel 5. Several rim sherds from two other vessels (V 56 and V 57) were also recognized. These vessels appeared to be very similar to Vessel 5.

In 1984 a larger area was opened up to the south, west and east of the original test unit. More redeposited, sterile sand was encountered, particularly on the south end, but little else of significance. The paleosol was thin and discontinuous in some parts, having been disturbed by cultivation. Another sherd cluster was found, again consisting of sherds from the originally recovered vessels, plus a few bone fragments and a few flakes. No other features were exposed. A summary of the recoveries for the entire block is found in Table 5.10.

Vessels	3	Stone Tools	0
Sherds	448	Worked Bone	0
Ochre	0	Debitage	8
Clam shell	0	Microdebitage	0
Egg shell	0	Cores	0
Bone (grams)	183	FCR (grams)	6

Table 5.10. Major artifact recoveries from Block 5 (Area = 16 m^2).

BLOCK 8

Block 8 was located on the edge of a gravel haul road which was mistakenly pushed through the middle of the site in 1984. In a few areas, artifacts were exposed by this unauthorized road building activity. Trowel and brush clean-up in one place adjacent to the road exposed a remnant patch of occupation paleosol resting in a shallow natural depression which had escaped the grader blade. Most of the paleosol was intact and contiguous, although the northern edge was somewhat deformed by heavy traffic passing over it prior to exposure. The paleosol surface was heavily laden with clusters of pottery sherds and lithic debris, and a large quantity of fragmented bone. This material surrounded the remains of a hearth, primarily on the west and south side. The area east of the hearth rose out of the depression, and had been bladed away.

Despite the small size of the area, a large and diverse artifact assemblage was recovered (Table 5.11). This material was of sufficient quantity to be examined using the cluster statistic, enabling potential activity areas to be identified and characterized objectively. Based on the distribution of principal artifact classes, three activity areas were defined within Block 8 (Figure 5.22). These were B 8.1, B 8.2, and B 8.3.

Vessels	3	Stone Tools	27
Sherds	676	Worked Bone	0
Ochre	2	Debitage	696
Clam shell	5	Microdebitage	0
Egg shell	2	Cores	10
Bone (grams)	2,008	FCR (grams)	3454

Table 5.11. Major artifact recoveries from Block 8 (Area = 16 m^2).

One partially reconstructed pot and two other vessels represented by small rim sherd portions were recovered from the the activity area west and south of the hearth. Vessel 93 and 94, the rim sherd remnants, were found within a metre of one another on the edge of the artifact scatter (Figure 5.23). Sherds from Vessel 92, of which a large part of the rim and neck were represented, were found in clusters scattered in a line from the northeast edge of the block to the southwest edge of the intact paleosol. One scorched sherd was recovered from the hearth.

Lithic Debris

Apart from a few flakes scattered about in otherwise sterile units, all debitage was restricted to Activity Areas 8.2 and 8.3. In AA 8.2 a wide, contiguous cluster of flakes was found around the north, west and south of the hearth. A second small cluster was found at 220 south, 73.5 m east. Debitage clustered on the west side of AA 8.3, and extended south from the area to AA 8.2. Only 361 pieces of microdebitage was encoun-

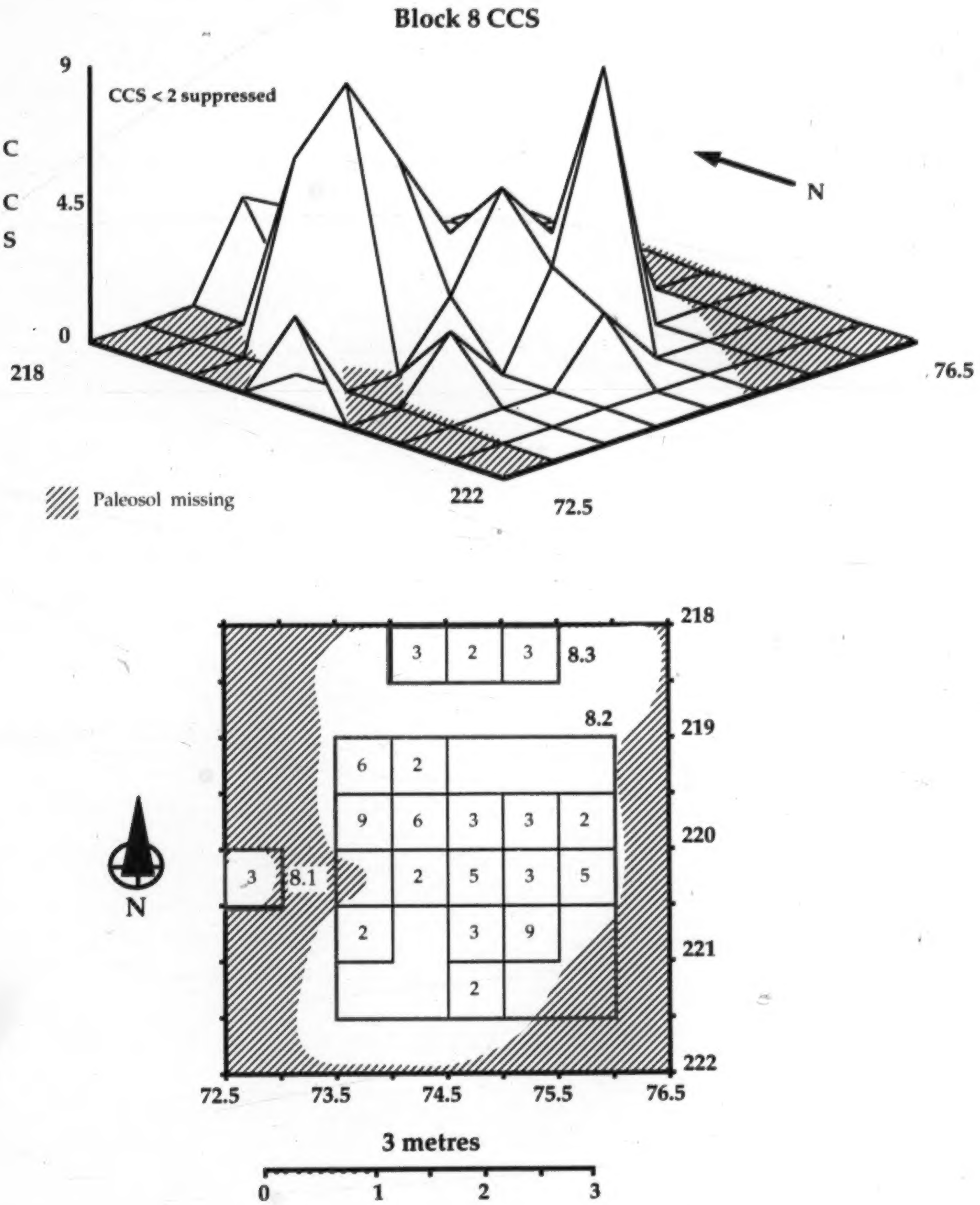


Figure 5.22 Defined activity areas based on CCS, Block 8.

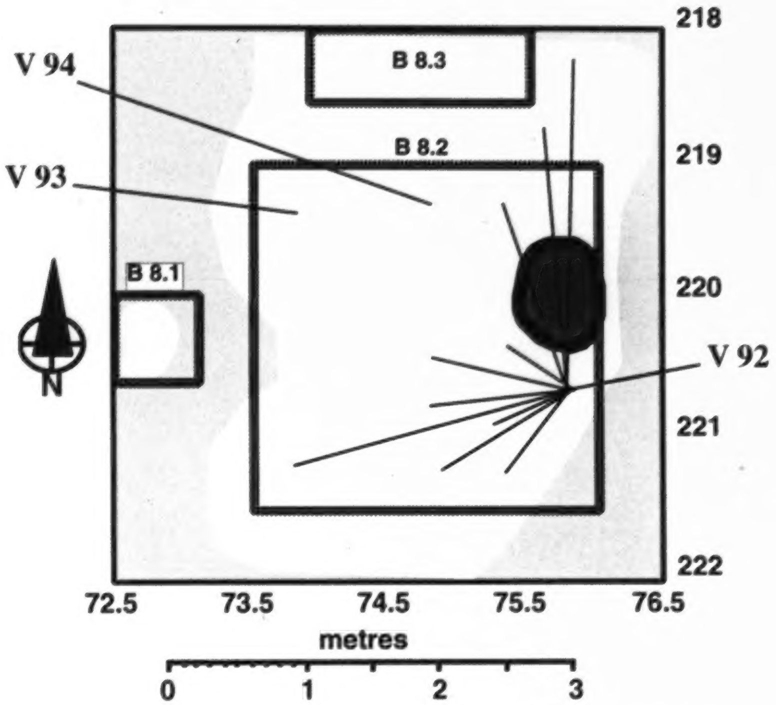


Figure 5.23. Activity areas and ceramic crossmends from Block 8.

tered during excavation of Block 8, despite detailed excavation of the occupation and screening through 2 mm mesh. All of this material came from the area immediately west of the hearth in AA 8.2, in association with the debitage recoveries.

Stone Tools

Of the 27 stone tools recovered from Block 8, all but two were found in designated activity areas. Three items were found in Block 8.1, comprising some form of tool cache (Figure 5.24). This cache contained the block's only celt. By far the majority of the tools, 22, were found in Block 8.2, the cluster area associated with the hearth. No bone tools were found in Block 8.

Fire-cracked Rock

Only a few large fragments of fire-cracked rock were recovered in activity area 8.2. These pieces were clustered south and west of the hearth. Activity Area 8.3 contained a substantial amount of fire-cracked rock. Some of this material had been pulled out of place by blading and lay on top of fired rock that was found in situ. The FCR may in fact have originated in activity area 8.2.

Rare/Exotic Recoveries

Two tiny fragments of ochre weighing less than half a gram were recovered on the

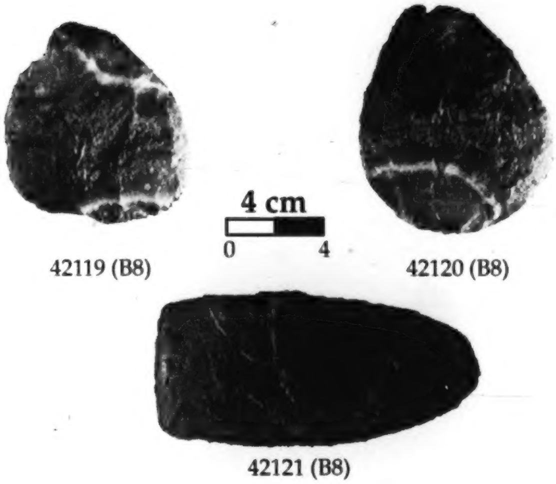


Figure 5.24. Biface and celt cache found in Block 8.

western periphery of the hearth in activity area 8.2. Several fragments of unmodified mollusc shell were collected in several locations within that activity area as well. Two small fragments of egg shell were recovered approximately 1.5 m directly west of the hearth, also within Activity Area 8.2. They were not identifiable as to species but do suggest that the area was occupied in the middle to late spring.

Faunal Remains

Over 2 kg of faunal material were collected from the three activity areas within Block 8. All material was highly fragmented. The most significant aspect of the small collection of identifiable remains was the total absence of small mammals, especially beaver, which predominated in the faunal assemblages of all other activity complexes on Bushfield West.

Context of Remains

Although only a portion of Block 8 was excavated intact, a significant area of the interpreted residence was examined, including the central hearth area around which a great amount of cultural debris was clustered. Using the CC statistic, three activity areas were identified (Figure 5.22). Their artifact content is summarized in Figure 5.25.

Activity Area Description

Activity Area 8.1 - In this area the paleosol had not been bladed away, and two ovate Swan River chert knives and a celt were recovered *in situ*. No other artifacts were found associated with them. The association of the finely prepared knives and the ground celt suggests that the materials represented a tool cache or perhaps a tool kit which was lost. There was not sufficient preservation to determine if the tools had been wrapped in leather or been held in a pouch of some form, as seems likely. The proximity of the

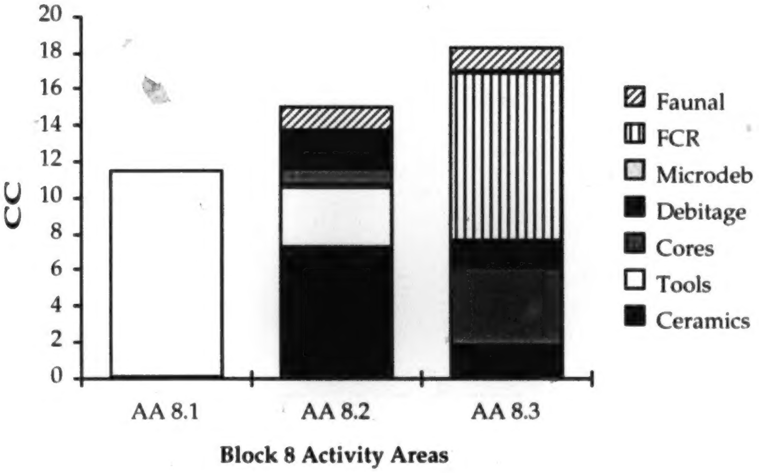


Figure 5.25. Concentration coefficient for selected activity areas in Block 8.

isolated collection to the nearby hearth suggests that the materials may be part of Activity Area 8.2.

Activity Area 8.2 - Activity Area 8.2 contained the bulk of the materials from the block. Large quantities of pottery, debitage, FCR, and faunal material were exposed *in situ* on the paleosol surface. A diverse stone tool assemblage and a small number of cores were recovered (Table 5.2, 5.3). Other important recoveries were small quantities of egg shell, clam shell and even traces of ochre, although the latter material was very tenuously represented compared to other activity complexes.

The most interesting feature of Activity Area 8.2 was the hearth, discovered on the east edge of the block. It consisted of an ash lens approximately 30-40 cm in diameter, overlying a thick red soil discolouration resting on black paleosol. The ash was heavily laden with artifacts, including pottery (one sherd crossmended with Vessel 92), a point tip, a bifacial knife fragment and a fragment of a grinding stone. Several cores and some debitage were also recovered from the ash.

Immediately surrounding the hearth, especially on the west and south sides, clusters of pottery, debitage and some fire-cracked rock were exposed. Most of this diverse assemblage of materials was found on the slope and base of a slight depression of which the hearth marked the eastern edge. It is probable that the materials extended to the east of the hearth, but the paleosol had been truncated in that direction.

Activity Area 8.3 - The most significant recovery from Activity Area 8.3 was fire-cracked rock, which was present at over nine times the expected rate by weight. However, much of this material was recovered in uncertain context; it had been dislodged from the paleosol surface by blading and may have been introduced from elsewhere. A general scatter of flakes and pottery was found in situ on the east side of the activity area, where disturbance was minimal.

Though Activity Area 8.3 is spatially distinct from AA 8.2, crossmended parts of Vessel 92 were found in the 50 cm square immediately to the east of AA 8.3. It seems likely that the general artifact cluster in AA 8.3 is related to the activity surrounding the hearth. It is possible that Activity Area 8.3 represents accumulated (or perhaps purposefully discarded) debris produced in the area surrounding the hearth in Block 8.

BLOCK 17

Approximately 10 m directly south of Block 5, at 340 m south, 84 m east, a cluster of pottery fragments was exposed by one of the grader passes during the removal of the plough zone. Almost all of the occupation had been severely truncated by cultivation in this area. However a slight dip in the paleosol stratum had preserved a small patch of paleosol on which the pottery rested. A single metre square was placed over the patch and the materials retrieved. Along with the pottery, three flakes and 21 grams of unidentifiable bone fragments were collected (Table 5.12). No features were observed.

Vessels	1	Stone Tools	0
Sherds	82	Worked Bone	0
Ochre	0	Debitage	3
Clam shell	0	Microdebitage	0
Egg shell	0	Cores	0
Bone (grams)	21	FCR (grams)	0

Table 5.12. Major artifact recoveries from Block 17 (Area = 1 m^2).

Although over 80 fragments of pottery were recovered, only one vessel (Vessel 7) could be positively identified through reconstruction. Many body sherds could not be mended to the pot, and it is probable that they represented the remains of one or more other vessels not sufficiently distinguishable to be used to designate a pot separate from Vessel 7.

Chapter 6

INTERPRETING ACTIVITY AREA RELATIONSHIPS:

MODEL BEHAVIOURS AND STRATEGIES FOR THEIR APPLICATION TO LIVING FLOORS

This study is concerned with the use of pottery on Bushfield West. The goals are to determine where pots were used on the site, for what purpose they were used and who used them. To lay the groundwork for this investigation, considerable effort has been directed at interpreting Bushfield West's archaeological remains at the household/residence level. This is the area in which people are involved in day-to-day tasks which make up the bulk of their economic and social existence, and where the use of pottery would play a role. Studies elsewhere have suggested that it is this analytical focus, rather than the abstract study of specific artifact categories, which more accurately reflects the full range of human behaviour on a site (Hayden and Cannon 1983; Brooks 1982).

Analysis of behaviour at the site level on Bushfield West proved to be a complicated task. A somewhat descriptive "laundry list" of artifacts and features discovered in each area was produced to fulfill provincial permit reporting obligations. Expanding the investigation beyond the purely descriptive required the fabrication of models of site use that could account for all of the activities identified in the excavated areas.

Modeling of household/residence patterns on Selkirk archaeological sites has never been attempted. In fact, these kinds of models have rarely been applied to hunting and gathering site remains anywhere in the parklands, mixedwood forest or boreal forest of Western Canada. An exception is Stevenson's study of the remains at Peace Point in northern Alberta (Stevenson 1986, 1991). In attempting to sort out several interpreted synchronic occupations on the site, Stevenson developed models of lithic artifact assemblage formation to explain the patterning of lithic distributions on those living floors. A model of artifact formation around hearths was also produced. Stevenson applied these models to build a general theory about the relationship of campsite location and tool manufacturing (Stevenson 1986: 99), and by extension the interpretation of division of labour on the site by sex (ibid: 99-114).

GENERAL ARTIFACT FORMATION PROCESSES WITHIN TENTS

Stevenson's models were founded upon Binford's (1978a,b) observations of ethnoarchaeological activity at the Nunamiut Eskimo Mask Site and Yellen's (1977) studies among the !Kung Bushmen. Both studies suggested that activities on hunting and gathering campsites could not be expected to be spatially segregated, and studies since then have tended to reinforce these conclusions (O'Connell et al. 1991). Archaeologists must be prepared to interpret archaeological remains with this in mind: one area of a site may have been the setting for a number of activities, each leaving behind its own debris. Furthermore, in the course of later activities, certain remains left behind from previous tasks may have been re-used, or at least displaced.

These problems have induced some skepticism among a few archaeologists who see ethnoarchaeological data as demonstrating that spatial patterning cannot be reliably interpreted because of blurring through area re-use (O'Connell 1987). Others are less pessimistic, and believe that although some distortion of specific activities reflected in the archaeological record will ensue during site occupation and subsequent abandonment, nevertheless these activities can still be interpreted (Gregg et al. 1991; Gargett and Hayden 1991). Also, some activities tend to occur more frequently in one place than another, and co-occurrences of the same activities in these places are not uncommon (Binford 1978a, Stevenson 1986:48). These observations indicate there is a basis for attempting to interpret specific activities (or at least general classes of activities) on different areas of a site. However, these interpretations have a firmer basis if they are related to theoretical models explaining how many of what kinds of artifacts will be left behind on the occupation surface after an activity is terminated.

Stevenson's lithic-oriented models are of lesser application to Bushfield West for several reasons. He was interested in explaining the distribution and composition of lithic debris on various occupations of the site, and thus invested a great deal of time in analyzing and categorizing various classes of debitage, particularly by size and stage of creation during the knapping process. This level of analysis was not performed with such rigour on the lithics from Bushfield West. Perhaps more importantly, this study is concerned with the use of pottery on the site. It would be more appropriate to develop models of pottery use in activity areas on Bushfield West, than to apply Stevenson's lithic use models.

Stevenson also devoted some effort in constructing a model of artifact deposition around open air hearths (Stevenson 1986), which he elaborated upon in a later publication (ibid.: 1991). He essentially modified Binford's "Drop-Toss" model of deposition first identified at the Mask Site (Binford 1978a). Binford identified two areas in which refuse was discarded in the vicinity of hearths. One was the "Drop Zone" which occurred at a certain regular distance from a hearth, close enough for an individual to be warmed by the fire but sufficiently distant to avoid becoming too hot or to be bothered by stray smoke. During craft activities, or when eating, various items fell directly to the ground and were considered discarded. Certain items were not dropped, however. These were tossed away from the area of activity, to the back and sides. This was called the "Toss Zone" (Binford 1978a: 339). Stevenson elaborated upon this model by adding an intermediate "Displacement Zone" (Stevenson 1986:103; 1991:278). This was an area where larger items initially discarded in the Drop Zone would have been intentionally or unintentionally displaced away from the hearth because they created some form of an obstruction (Figure 6.1).

The Binford-Stevenson open hearth model of artifact deposition is of problematic application to the remains at Bushfield West for several reasons. The model is heavily

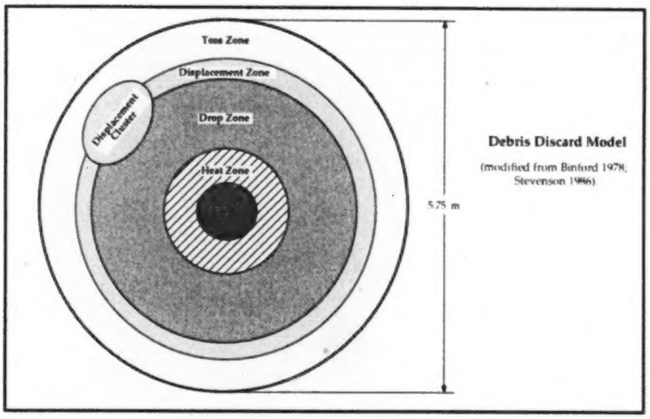


Figure 6.1. Patterns of debris discard proposed by Binford (1978a) and Stevenson (1986).

dependent upon the use of artifact-size categories and provenience levels that are largely incompatible with those used for the Bushfield West analysis. Only debitage and microdebitage categories approximate the size divisions needed to test the model (i.e., >6 mm versus <6 mm), and most of this material at the 6 mm size range would simply be left in the Drop Zone. Bone, FCR and tools were not placed in any size category in the catalogue, and would require re-analysis for direct application. Another problem is that this model is based on artifact disposal around open-air fires, while the remains at Bushfield West, as will be suggested below, appear to have been confined within some form of tent-like structures. Although Stevenson suggests that the model should apply in a number of situations which have the same cultural formation processes (Stevenson 1991:293), it is apparent from the remains recovered on Bushfield West that a more complicated discard mechanism is taking place, as a consequence of the activities within a covered structure.

The most telling evidence for this interpretation is the presence of homogeneous discard piles within interpreted structure confines, and the presence of heterogeneous debris within the hearths. The areal extent and configuration of these debris piles varies, but for a few exceptions they are elongated, incorporating at least two provenience units (two adjacent 50 x 50 cm cells). The accumulations often appear to extend from a hearth outward in no particular direction, with the point of greatest accumulation appearing between one and two metres away. Excavation of these piles indicated that they were not the product of drop discard, since they were heterogeneous in content, often containing debitage, microdebitage, bone fragments, pottery sherds, complete and incomplete tool fragments and even egg shell, mixed together as an amorphous mass. This same mix of debris was found within most of the larger hearths, further ruling out that it was drop discard.

The most plausible explanation for this discard pattern is that the material is being collected as it is dropped, probably on skins. Periodically, the skins are lifted and the material is either dumped to the periphery of the working area, into the hearth or out beyond the structure entirely. This kind of disposal pattern appears to be quite rare in the archaeological record, although Dyck discusses it when interpreting bone debris clustering at the Harder Site (Dyck 1977:191). This depositional pattern is termed *Cluster Discard.*

There are several implications to site structure interpretation suggested by this pattern. First, the fact that drop debris is being collected suggests that intensive labour or food consumption resulting in the accumulation of excessive waste debris is anticipated, necessitating contingencies being made to contain this debris. If the work or consumption were expedient in nature, probably the waste lithic material, bone etc., would have been allowed to fall directly onto the ground and not onto a skin. Secondly, intentional collection of debris suggests that people are working or eating in a confined, semi-permanent area where drop debris cannot be allowed to build up in the area they are occupying. This pattern is strongly suggestive of a structure which is inconvenient to move, such as a tent or lodge.

Cluster Discard Characteristics

Though it is apparent that some effort was made to control the build-up of debris within a particular area of a structure, in general it appears that accumulated debris disposal was for the most part expedient. Waste was simply tossed out of the immediate area of production or consumption, probably without the individual moving his or her position except as necessary to remove the collection mat. This is termed *Type 1* cluster discard (Figure 6.2). On Bushfield West, the remains of such discarding tended to accumulate in the Toss Zone (as described above), with occasional overlap in the outer area of the Drop Zone. On occasion (for example, in Block 2.1), these discard clusters exhibited a physically elongated morphology, such that a cluster boundary extended beyond the Toss Zone into an area in which general artifact accumulation was quite minimal. In such situations it could be interpreted that debris was discarded beyond the boundaries of the activity complex (therefore, beyond the walls of the enclosing tent structure).

A second, smaller accumulation of debris invariably appeared within most hearths on the site. This cluster discard pattern, termed *Type 2*, was also probably expedient in nature, although the relative frequencies of materials being tossed in were different (Figure 6.2). Debris consisted usually of smaller sized materials, especially microdebitage. It could be envisioned that a craftsman working near the hearth for light and warmth would dump minor amounts of debris straight ahead without breaking his or her concentration. Some stone tool fragments were found in hearth remains, which is consistent with this interpretation, although these items could have been a product of toss discard as well. Charred faunal remains were found in the hearth as well, although generally not in high frequencies.

A third type of discard cluster was identified as occurring well beyond the apparent area of debris production. This type of discard cluster is represented by discoveries in

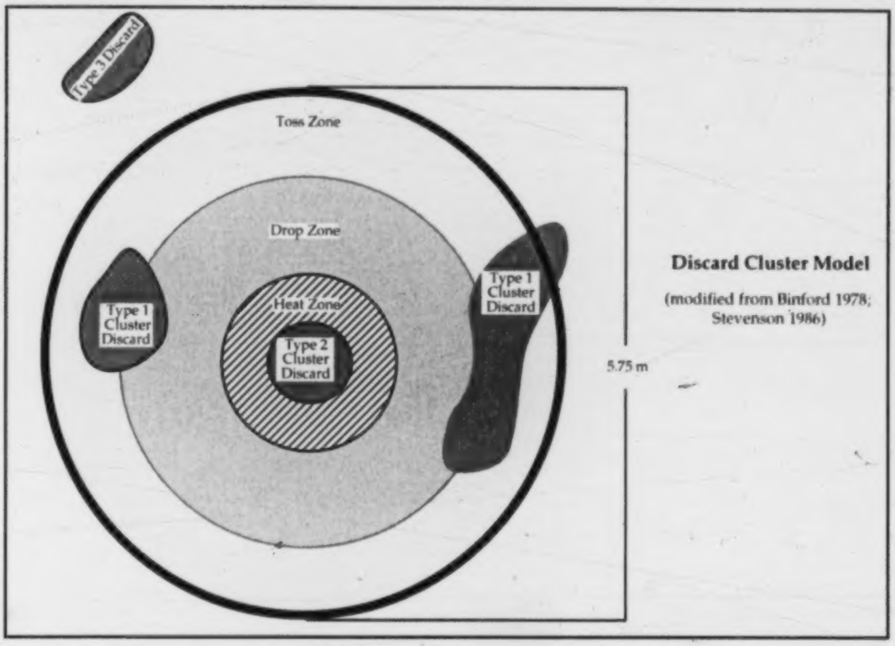


Figure 6.2. Type 1, 2 and 3 cluster discard and its relationship to discard patterns proposed by Binford (1978a) and Stevenson (1986).

Block 3. It represented purposeful dumping, for debris was collected and completely removed from the activity complex (tent structure) and disposed of in an unoccupied area a number of metres away. This type of cluster disposal, called *Type 3* cluster discard, was recognized by its lack of direct spatial association with defined activity complexes on Bushfield West (Figure 6.2). Unfortunately, it could be associated with a specific activity complex with any certainty only through ceramic conjoin analysis.

Cluster discard poses some implications in the interpretation of the use of space within tents. Although Types 2 and 3 do not take up usable space in a confined area, it appears that Type 1 cluster discard presupposes that a significant portion of the floor space of certain tents on Bushfield West was not occupied by individuals, since it would be a questionable practice to throw waste into another person's living space in any society. In several tent areas, as much as 80% of floor space appears to have been strewn with debris. This pattern may have some implications in the interpretation of the number of individuals actually residing, or at least making use of, the structure.

MODELING HUMAN BEHAVIOURS ON BUSHFIELD WEST

Models of artifact deposition help to account for the distribution of artifacts in an area, but they are insufficiently capable in themselves of defining the kinds of specific behaviours responsible for producing the archaeological remains. However much one wishes to avoid the question, if archaeological remains are to be interpreted on Bushfield

West, categories of human behaviour have to be defined to account for the all the activity areas identified on the occupation floor. A categorical framework that addressed these requirements was accordingly designed. Each behavioural activity included a definition of that activity, the archaeological by-products produced by it, a prediction of where these by-products would be found, and how they would be deposited on a site. Finally, using various sources of evidence, a postulation of the gender of the individual or individuals responsible for each activity was made.

Elsewhere on Bushfield West, certain inferred activities such as woodworking and ceremonial sweating were uncovered during excavation (Gibson 1994), usually in areas isolated by ground disturbance caused by cultivation and fluvial erosion. However, because there was no direct evidence to infer their having taken place in the specific ceramic-bearing areas addressed in this study, they have not been modeled.

Gender Modeling

In the archaeological record, it is often difficult to determine how recovered artifacts were used. It is much more difficult to determine whether men or women used the implements, as attested by the paucity of archaeological literature addressing this problem. In fact, recent conference sessions dedicated to this task yielded disappointingly few examples of gender identification archaeologically (Brandon 1989; Walde and Willows 1991). Much of the problem lies in the hesitancy of archaeologists to commit themselves to addressing this task, primarily because there are so few supporting ethnographic data to identify differing gender roles in a society, using material culture.

Several studies have addressed the issue of recognizing gender as manifested in the archaeological record of northern hunting and gathering people. Stevenson (1986:106-110) summarized Subarctic literature which indicated that there was indeed differentiation in activities between males and females in campsites, and that these activities could be recognized in the archaeological remains they produced. Stevenson defined a model which focussed on the differences in stone tool types produced by men and women, and the resulting variation in debitage so generated by the tool manufacturing activities (ibid.:110-114). His model was strongly based on the work of McGhee (1979) who hypothesized gender-based differentiation of the use of space in dwellings he excavated in the high Arctic.

More recently, Guenther (1991) hypothesized differential gender usage at the Horse Creek Site in northeastern Wyoming. Through analysis of hearth features and their contents he concluded that the site was primarily devoted to plant processing. Using specific ethnographic descriptions of Plains Indians written by Lowie (1963, 1982) and Catlin (1973), which indicated strong gender differentiation of labour, he hypothesized that the site was devoted to plant food acquisition and processing of stores, and was primarily used by women (Guenther 1991:20).

Hughes (1991: 43-46) also interpreted gender differentiation of site use on the Mini

Moon Site, a Besant hunting camp located in eastern Montana. Using a combination of general ethnographic Plains data and Alaskan ethnographic and ethnoarchaeological data she constructed site use models which were used to identify female food processing areas and male tool-making areas on the site.

Hudecek-Cuffe (1996), in a comprehensive analysis of Northern Plains Paleoindian archaeological data, examined the interpretation of gender roles in the archaeological record. She argued that gender relations, often considered static and biologically based in hunting-dominated archaeological interpretations, were in fact flexible and overlapping, and that the archaeological record should reflect this pattern. She recommended examining subsistence and settlement strategies from the perspective of gender in order to restore a balance in the conception of the Paleoindian past. In order to accomplish this goal, she compiled a somewhat generalized list of approaches for linking gender with the archaeological record (ibid.: 257-270), but furnished no method of application nor any specific instance of archaeological application.

Despite Hudecek-Cuffe's (1996: 152) and others (Wobst 1978) cautionary imprecations regarding application of ethnographic data to archaeological interpretations, Algonquian and Athapaskan ethnographic and ethnohistorical data do indicate that there was a relatively standardized division of activities between males and females of a commensal group when earliest post-European contact records were made. This division is reflected in the organization of space (Tanner 1979), the consumption of animal parts (ibid.) and in the division of labour (ibid.; Hanks and Pokotylo 1989; Jarvenpa and Brumbach 1983; Morantz 1983). Since the remains on Bushfield West have been interpreted to be of ancestral Cree origin, it seems justified to adopt the direct historical approach since their subsistence, technology and environment were similar to the Algonquian and Athapaskan groups addressed above (Ascher 1961:319-320).

Therefore, each behavioural category includes a postulation as to the gender of the individual who would most likely undertake activities characteristic of the behaviour. On Bushfield West, it is postulated that many activities probably reflected such divisions. If so, the implications for the interpretation of pottery use on the site are important. If gender-specific areas can be identified, and reconstructed pots can be shown to have been used in the areas, then it may be possible to determine if men and women used different kinds of pottery, and perhaps used pots in different manners. Of particular interest is the implication that men may employ certain styles of pottery, and that women may make use of pots with different styles, and that this behaviour may be one of the explanations for stylistic variability observed in Selkirk ceramics.

Archaeologically, the strategy for characterizing behaviours by sex was effected through the examination of activities in various site areas using the defined behaviour categories, then aligning the behaviour combinations with pre-defined models describing use of an area by gender. Unfortunately, locally available ethnographic data that could be used to build behaviour and area use models addressed only certain kinds of activities.

Some of these ethnographic observations were recognized to have been possibly inapplicable to the Bushfield West situation. Somewhat generalized ethnographic models of sexual division of activities were by necessity employed to characterize activity participants by sex. Unfortunately, even ethnoarchaeological studies have often failed to differentiate activities by gender adequately (Clark 1989:91; Janes 1983). Therefore, it is acknowledged that the postulated gender roles are modal and cannot be used to determine the sex of an activity participant in every case.

DEFINED HUMAN BEHAVIOURS

Lithic Reduction

Definition - The removal of flakes from cores in order to produce either preform tool blanks or flakes suitable for re-working into tools.

By-products - Large quantities of debitage, generally found in clusters, small amounts of microdebitage, usually found mixed with debitage, and cores, often found associated with the clusters. The question of how much microdebitage is actually generated by lithic reduction is difficult to determine, and appears to be a product of the kinds of lithic material that are being reduced. Experimental replication of lithic reduction processes by the author produced differing results depending upon the lithic material reduced (Gibson 1986b, 1990). Percussion knapping of glass cores (similar to obsidian and possibly some fine-grained cherts) generated copious amounts of lithic fragments less than 6 mm in size. These cores literally disintegrated into fragments long before they were completely exhausted, probably as a consequence of secondary compression fracturing of the lithic material. On the other hand, percussion reduction of unprovenienced Swan River chert cores from the Bushfield West collection generated remarkably little microdebitage, and this observation is corroborated by other researchers who have worked extensively with this material (Bruce Low, Jim Finnigan, personal communication 1997). It appears that Swan River chert cores, which possesses a macrocrystaline, coarser grained lithic structure, are less prone to secondary compression fracture than microcrystaline obsidians and cherts, and can be reduced much more completely (albeit with much more effort) without collateral waste fractures occuring. Since the vast majority of stone knapping on Bushfield West involved Swan River chert lithic material, it is assumed for this study that lithic reduction of this material produces much less microdebitage that has been reported elsewhere for similar kinds of activities using microcrystaline lithic materials (e.g. Healan 1995).

Occasionally tools such as hammerstones and anvils may also be recovered in the vicinity of lithic reduction activity areas.

Location - Away from food preparation/consumption areas. Possibly near fire for heat and light.

Depositional Pattern - Direct or Drop deposition into the Drop Zone. Larger unusable fragments may be thrown to the Toss Zone. Within a tent, it is expected that this type of activity would result in Type 1 discard cluster deposition as well. This behaviour makes the identification of the exact location of lithic reduction difficult, since the debitage would be collected on mats or skins and periodically tossed aside, entering the Toss Zone. Nevertheless, discard clusters characterized by considerable quantities of debitage and some microdebitage could be used to infer that lithic reduction took place in a tent areas in general.

Exotic stone material may have been broken up and re-workable flakes curated. Only microdebitage and a relatively small number of odd-shaped flakes of rare lithic material were probably discarded. In such cases, it seems plausible that exotic stone was probably worked on over a collection mat, and that the remains would be disposed of as cluster discard.

Personnel - Primarily men, based on most ethnographic and ethnoarchaeological data. However, given the possible androcentric bias of many ethnographic recorders (Conkey and Spector 1984), and archaeological interpretations (Hudecek-Cuffe 1996), women probably worked with stone much more than has ever been reported. At the very least, it is speculated that women reduced cores to obtain flakes for expediency tools, and for more finished tools that they manufactured for themselves.

Stone Working

Definition - The act of modifying a flake or a preform into a finished tool, or resharpening of an existing stone tool.

By-products - Large quantities of microdebitage and a high proportion of broken tools resulting from sharpening or remanufacturing errors. Microdebitage should be found in dense clusters, with broken or unfinished tool remains mixed in with the cluster. Smaller amounts of larger sized debitage would also be expected. Tools such as small cylindrical hammerstones or pointed and polished bone and antler flakers may be found in association. These latter tools would be recovered in a worn or fragmented state, since they would usually be curated if they were still usable.

Location - Near a source of light and warmth, probably beside a fire within a residence or shelter.

Depositional Pattern - Direct or Drop deposition into the Drop Zone, and Cluster Discard into the Toss Zone. Direct deposition would be characterized by high density homogeneous clusters of tiny microdebitage flakes. Cluster discard would be represented by more heterogeneous clusters of microdebitage and flakes, along with bone, potsherds and other discard debris, although the clusters would be dominated by microdebitage.

Personnel - Primarily men. Women may have produced the bulk of the retouched flakes as expediency tools. Stevenson (1986), using observations made by McGhee (1979) suggests that stone tools manufactured by women may have been less specialized, reflecting the more generalized purposes for which their tools would have been designed.

Since these tools did not require detailed retouching, the average size of flakes produced by women would be larger than corresponding flakes produced in areas where men were manufacturing more specialized tools (McGhee 1979: 51; Stevenson 1986: 110-114). This inference suggests that tabulation of weight/frequency ratios for debitage could be used as a rough indicator of female/male lithic manufacturing. On a practical level using the parameters defined for the Bushfield West analysis, areas which are dominated by microdebitage (stone flakes which will pass through 6 mm screen mesh) could be strongly associated with male stone working behaviour. Hughes (1991:30) suggests a more general male/female tool manufacturing pattern in which men manufactured sophisticated and time-consuming tools used in hunting and warfare and women manufactured tools used in meat processing and food preparation.

Bone Working

Definition - The process of modifying bone (or shell) into a finished tool or utensil, or re-working an existing tool.

By-products - Bone shavings and splinters, and unfinished bone and shell pieces bearing evidence of notching, incising or drilling. Tools such as sharp drill bits, awls or knives may be found in association.

Location - Near a source of light and warmth, probably beside a fire within a residence or shelter.

Depositional Pattern - Shavings and splinters were probably dropped directly onto a collection mat in a tent, then tossed aside as Type 1 or Type 2 discard. Preservation would probably have been too poor to recognize the remains during excavation.

Personnel - Men and women. In a camp situation, men may have had more time to do specialty bone and shell working (production of bone and shell beads, pendants etc.), since women would likely be preoccupied with campsite maintenance. However, women undoubtedly manufactured some of their own specialized domestic tools, such as hide scrapers and needles.

Hide Preparation

Definition - The treatment of animal skins for general domestic use. It includes hide scraping, rubbing, smoking and curing.

By-products - Most hide remains (hide strips, hair, grease) would be unpreserved in the archaeological record. Secondary evidence would consist of hide scraping tools (beamers, fleshers and large endscrapers) and the presence of small, isolated hearths, which may have served as smudge pits. Anomalous clusters of post holes may indicate the former locations of stretching racks.

Location - Near small hearths, possibly in areas away from domestic activity.

Depositional Pattern - Drop Discard of perishable remains would not be found in the archaeological record. Discarded or abandoned tools were probably tossed aside, or dropped in place if preparation took place in a normally disused area in a tent.

Personnel - Primarily women. Tanner (1979:70-71) indicates that among the Mistassini Cree, men may help women prepare large hides, but that it was normally considered a woman's task.

Hide Working

Definition - Hide and fabric repair, including clothing manufacturing and maintenance.

By-products - Hide working can be identified ethnoarchaeologically by the presence of rack support pole remnants (Janes 1989b:136). Unfortunately, most of these products would be unpreserved in the archaeological record. Secondary evidence includes presence of bone and stone awls, knives and needles. Expediency tools such as retouched flakes would probably be commonly used. They would serve as multipurpose, unspecialized scrapers and knives.

Location - Away from messy activities such as flintknapping or bone butchering, near a fire for warmth and light.

Depositional Pattern - Since there would be few lasting material by-products produced from this activity, deposition would be marginal. Uncurated tools may have been dropped in place if the working area was situated in a marginally used location in a tent. If working occurred near the fire, tools were probably tossed away from the fire area, into the Discard Zone, or simply dropped in place.

Personnel - Primarily women.

Butchering

Definition - Activities related to large and small animal carcass dismemberment

By-products - Remains of butchering may have consisted of isolated, relatively unfragmented faunal elements, possibly those with lesser meat content such as vertebrae or large mammal skull pieces. Stone choppers and expediency tools (bone choppers) may have been left in association with the animal remains. Small mammals such as beaver and most birds were probably butchered right in the living area, and most elements would be represented in the identifiable faunal collection. Small hammerstones, biface knives and retouched flakes should be expected in small mammal butchering areas.

Location - Large mammal butchering probably took place near where the kill was made, then the animal carcass sectioned for easier transport to the camp. Secondary butchering of the carcass portions may have taken place in the camp. Small mammals were probably butchered in the living area where it was warmer.

Depositional Pattern - Processing of large mammal sections probably took place outside of a residence. Smaller sections were probably brought indoors for cooking. It is assumed that most of a small mammal would be processed for consumption, so little would be discarded prior to cooking. Anything not cooked should have been removed to the periphery of the hearth area, into the Toss Zone.

Personnel - Ethnographic data (Tanner 1979; Janes 1983) suggest that large mammals killed away from camp were initially sectioned there by men, and brought back in pieces. At the camp, women often carried out secondary butchering for consumption. Small mammals were brought back whole, to be butchered by women.

Bone Breaking

Definition - Secondary processing of animal bones, usually prior to boiling.

By-products - Broken up bone would be the primary by-product. Intensive bone boiling for grease extraction should produce finely pulverized bone fragments. Smaller grinding stones and mauls, and large rocks (serving as anvils) would be used for breaking the bone.

Location - Large scale bone breaking probably took place outside of residences, possibly near large hearths. Small mammal bone may have been broken up inside the residence prior to being cooked.

Depositional Pattern - Bone fragments not suitable for rendering were probably left in the Drop Zone, where they were splintered. These would be articular ends of long bones which could not be broken up, skull fragments etc. Most other bone pieces were probably curated for further processing. Fine splinters were probably left where they fell, unless they were collected on a mat or robe. Small mammal bone smashing may have occurred in a tent, near the fire. However, the smashing was probably done on a mat or skin robe, and what was not processed was probably removed to the Toss Zone as Cluster Discard.

Personnel - Although bone breaking may have been carried out by both sexes in some cases, most ethnographic evidence indicates that bone breaking for grease making was primarily a woman's task (Vehik 1977:171).

Cooking

Definition - Preparation of food by heating. Food could have been meat or vegetables, but analysis on Bushfield West was not sufficiently intensive to identify remains of cooked flora.

By-products - Evidence of pot cooking should appear in the form of finely smashed, uncharred bone which would have been easily and most efficiently boiled in small pots or other types of container (Vehik 1977:171). Potsherds may be found in hearth remains, an indication that a vessel may have shattered on the fire. Vessel remains bearing cooking residue would be the most reliable evidence that food was cooked in pots (this evidence will be addressed in more detail in following chapters). The presence of charred faunal remains may indicate fire roasting. Roasting could also have been more elaborately effected by heating rocks in a pit, then packing meat and vegetables around the rocks and sealing the pit for several hours. Remains of this type of cooking technique would consist of a small pit full of rocks, perhaps containing some bone, although most food would probably have been removed from the pit for consumption. There should be little evidence of charring on bones. A large fire hearth for heating the rocks would likely be located in the vicinity. Fire-cracked rock would be a ubiquitous by-product, particularly during pit roasts.

Location - Cooking would occur in the immediate vicinity of a hearth, generally within a residence. Pit roasting may have occurred outside of a residence, although, in colder weather, the pit may have been built right inside the structure area.

Depositional Pattern - Pot-cooked remains which could not be consumed were probably tossed aside in a pile, as Cluster Discard. Individual roasted animal pieces were probably picked at, then tossed aside into the Toss Zone. Some pieces may have been tossed into the fire, where they would be at least partially consumed by the flames and coals.

Personnel - Pot cooking was probably carried out primarily by women. Men may have preferred to roast certain animal pieces for personal consumption. Pit roasting may have been a female-dominated activity because of the kinds of work that would be required (bone breaking, wood gathering etc.). Although not specifically mentioned above, pots may have been used to heat water to make hot beverages from plant remains, like the well-documented "Labrador tea" of the boreal forest (Leighton 1985). It could reasonably be expected that beverage making was probably carried out by women, and occasionally, men. For example, Tanner (1979:78-79) indicates that Mistassini Cree men made their own special beverages, including a bone soup made in a large pot and a kind of raisin beer.

Ochre Use

Definition - Ochre, a locally procurable iron oxide compound red or orange in colour, is often associated with ceremonial body decoration and in the coloration of ceremonial objects. Its presence in quantity in an activity area usually connotes ceremonial activity.

By-products - Ochre can be recovered in several different forms. Lumps or nuggets of ochre are probably the most frequently found form of the substance, representing loss or discard. Ochre patches or clumps exposed on a living floor may indicate that some of the powderized pigment was dropped or discarded. If found in quantity, manufacturing is suggested, particularly if grinding tools are found in association. Broad stains which cover a large area (20-40 cm diameter) and seem to penetrate into the matrix of the living floor may represent major spills or discards of liquefied ochre. This type of ochre recovery in an area would imply that painting (rather than just manufacturing) was a major activity, since it would probably have been applied in its liquid form. Evidence of paint making would be supported by the presence of grinding tools stained with the substance. Similarly, containers bearing stains may have held liquefied ochre, suggesting paint use.

Location - Paint manufacturing and use probably took place in sheltered areas such as tents.

Depositional Pattern - Ochre fragments probably would fall directly to the floor of a tent area and not be successfully curated. Similarly, liquid ochre would soak into the ground at the point of spill. It is unlikely that a surplus of ochre fragments or paint would be purposefully discarded, in view of the substances presumed rarity. Thus, it is unlikely that ochre powder or paint would be found in areas of discard such as the Toss Zone.

Personnel - Ochre may have been used by both men and women, although ceremonial use of the substance was most probably made by men.

Ceremonial Interaction

Definition - Interaction behaviour in this study is used to define formal or informal meetings and commerce between unrelated households or commensal units. Ceremonial behaviour usually represents some form of ritual, or reflection of a code of ceremony used in conducting certain activities. It is often associated with religious observances and is probably an indicator or some type of religious activity being undertaken. Ceremonial activity could be most obviously expressed in ritual exchange and/or smoking of tobacco, particularly between trading partners or unrelated individuals seeking alliances.

By-products - The most compelling evidence for ceremonial exchange would be the presence of exotic goods in an activity area. Exotic goods are defined as any objects which could not readily be obtained or manufactured domestically, and were most likely secured through exchange with foreign individuals. Most ceremonial exchange goods were probably not functionally valuable; their intrinsic value lay in their rarity. Some flint knapping materials would be of sufficient value to trade, however. Exchange could also be indicated by the presence of "aberrant" ceramic vessels showing decorations or forms foreign to "normal" pottery, although Hanna (1983) suggests that changes in ceramic styles (and in manufacturing technique) could be evidence for exchange of women between groups, rather than ceramic trade. Evidence of smoking would be circumstantial at best, since most by-products would not survive in the archaeological record. The most explicit evidence of smoking activity would be the recovery of stone or clay pipe remains.

Location - Ceremonial activities probably took place in residences, possibly in segregated areas away from domestic activity.

Depositional Pattern - Exotic materials were probably not discarded in a cavalier manner. Objects such as tools or ornaments may have been dropped accidentally and lost around a hearth. Broken objects, if of a non-sacred nature may have been tossed aside, however.

Personnel - Ceremonial activity probably occurred most frequently among men, and would be expected at certain times of the year when a number of households were temporarily encamped together. No doubt female ceremonial activity also took place at

Bushfield West, although material evidence (and existing models for its interpretation) seem lacking at this point.

The Effect of Scavenging

Scavenging of debris could have significantly altered how humanly deposited debris is interpreted. Most Selkirk campsites were probably inhabited by dogs, since they were the principal pack animal in pre-contact times. These animals probably would have survived on food discarded by people. Wild animals may also have scavenged through campsite debris once the area had been abandoned by humans.

On Bushfield West most remains appear to have been finely smashed prior to being dumped, leaving poor fare for garbage browsers. Nevertheless, a few discarded long bones may have been removed or further broken up by carnivore action. In fact, McKeand (1995:344) did observe carnivore modifications such as pitting, punctures, scoring, furrowing, chipping and even evidence of digestion on mainly large mammal remains from the site, amounting to approximately 2% of the large faunal sample she analyzed (ibid.:235).

Chewing marks on faunal elements would most frequently be expected in secondary refuse dumps where dogs would have had the easiest access, although little is known about the access of dogs to residences or cooking areas. Wild animal scavenging may confuse this expected distribution, since their access to areas would not be restricted after site abandonment.

ACTIVITY AREA ANALYSIS

Previous chapters have detailed site conditions, artifact content, material culture distribution, and the methodology whereby this information was used to define the location of hypothetical activity areas within the site. Once objectively defined, a critical (and often ignored) task is to examine each activity area to infer the human behaviour evinced there. For this study, the task involved analyzing each area with reference to the "modal" behaviours defined above, with the purpose of determining what activities took place in the area, the personnel involved, and the relationship of one activity area to one another. Given the amount of information that was available for analysis, lengthy and detailed descriptions and associated interpretations were unavoidably necessitated.

Normally, in situations such as this, activity area interpretations are carried out with only cursory attention to any kind of detailed analysis. Rarely are analytical results described in detail; these are usually placed as an appendix to the main part of a manuscript. However, it is argued here that detailed activity area analysis is an integral part of the process of interpreting human behaviour on an archaeological site. Simply to hypothesize that an activity occurred without elucidating the reasons for arriving at the hypothesis, and not even alluding to the raw data, is to invite skepticism which will subliminally (or overtly) shade the results of the site analysis. Consequently, during this study a considerable amount of time was spent examining each identified activity area, and interpreting it in detail. The previous chapter included a truncated version of this interpretation (for a fuller analysis see Gibson 1994) to convey the character of the activity complexes that are discussed.

The archaeological studies of Bushfield West demonstrated that many different things were taking place at the time the site was occupied. There was evidence of butchering, bone rendering, pottery firing, communal cooking and ceremonial sweating. As well, people were living and socially interacting on the site, using a residential organization based on commensal domestic dwellings and special areas devoted to tasks not directly related to subsistence or general domestic behaviour. Since this work expressly deals with activity area analysis as reflected in ceramic behaviour, many of these activities which normally do not involve pottery use are not dealt with here. The activities which do incorporate pottery are particularly addressed, and the results of the ceramic analysis carried out in the following chapters are integrated into their interpretation. These activities reflect female and multi-gender domestic behaviour and male ceremonial behaviour. They will be examined in detail in Chapter 9.

Chapter 7

THE CERAMIC RECOVERIES FROM BUSHFIELD WEST

The purpose of this chapter is to examine the ceramic recoveries from Bushfield West from the point of view of a site assemblage. This particular ceramic assemblage consists of 96 recognizable vessels (see Appendix B and C for a detailed description of all vessels). Although a significant proportion of these vessels are represented only as fragments, it is contended that each pot yields at least some information which can be used to interpret site behaviour. The analytical approach used in examining each vessel has been briefly outlined in Chapter 1. Pots will be analyzed in terms of their manufacturing characteristics, their shape, their function, who used them, and how they were discarded. Vessel decoration, normally the primary observational focus in the study of most pottery collections, will also be considered. However, decoration on the Bushfield West pottery assemblage consisted of a few characteristics common to nearly all vessels, even those represented by rim fragments. Thus, decoration represents one of the less-emphasized forms of ceramic variability which will be documented on the site.

ASSEMBLAGE OVERVIEW

Although there is some variation in individual vessels from Bushfield West, most pots are similar to one another. A typical vessel has a globular form with rounded or slightly angular shoulders, a moderately constricted neck and a well-formed rim, either vertically oriented or outflaring. In fact, there is very little variation in the overall shape of vessels from Bushfield West, or indeed of vessels from any Selkirk site. Any variation appears in minor form only, such as a modification of the rim so that it flares outward, is lengthened, or is given a more complex shape. There appears to be no significant variation in the types of vessels made: almost all can be termed "jars" (Rice 1987; Smith 1983; Figure 7.1). A few vessels found on Bushfield West may have been bowls (eg. Vessel 17, Appendix B), but they were incomplete, and

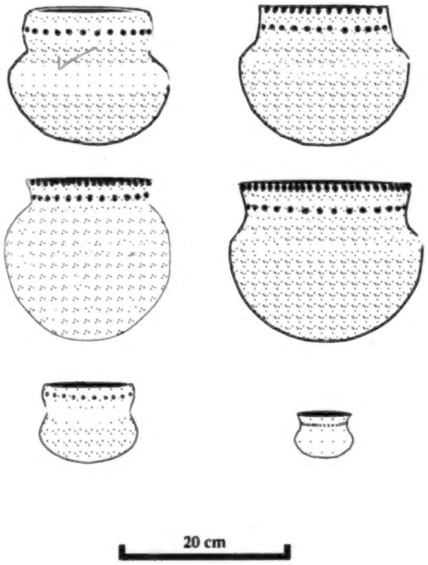


Figure 7.1. Some reconstructed pottery vessel forms and sizes found on Bushfield West.

were not found in primary contexts associated with other *in situ* remains.

Most vessels bear the impression of a fabric weave on their exterior. Occasionally these impressions have been smoothed over all of the vessel exterior, or in certain parts only. Decoration on almost all vessels is restricted to the impression of circular punctates on the central part of the rim, and cord-wrapped-tool (hereafter, cwt) impressions on the rim lip. Since this pottery is assumed to be indigenous to the Saskatchewan River region, the pots were hand made (without a wheel), air dried, then hardened over an open fire. Thus, the pottery varies little from the descriptions of Selkirk ware recovered elsewhere in northern Manitoba and Saskatchewan (Dickson 1980; Hlady 1971; Meyer 1981).

Sample Size

Table 7.1 summarizes the vessel recoveries from the site. Over 50% of the vessel remains consist of small and large single rim sherds, usually representing less than 5% of a single pot. Table 7.2 and Figure 7.2 summarize the relative proportions of vessels represented in the ceramic sample. Rim and neck portions comprise nearly 80% of the vessel sample. Vessel reconstructions to the shoulder and below account for 20% of the sample.

Vessel remains were recovered from both disturbed and undisturbed contexts. Table 7.3 summarizes the vessel counts for each excavation area on Bushfield West. The

Category	Vessel Amount	N	%N
Small rim sherd	up to 1% of vessel	31	32.4
Large rim sherd	up to 5% of vessel	22	22.9
Sherd collection	up to 10% of vessel	10	10.4
Small section	up to 20% of vessel	14	14.6
Large section	up to 35% of vessel	5	5.2
Half pot	up to 50% of vessel	8	8.3
Three-quarter pot	up to 75% of vessel	3	3.1
Whole pot	over 75% of vessel	3	3.1
Total		96	100.0

Table 7.1. Summary of vessel amounts represented in ceramic assemblage.

Category	N	%N
Rim	45	46.9
Rim to Neck	31	32.3
Rim to Shoulder	7	7.3
Rim to Body	6	6.2
Rim to Base	7	7.3
Total	96	100.0

Table 7.2. Summary of vessel completeness in ceramic assemblage.

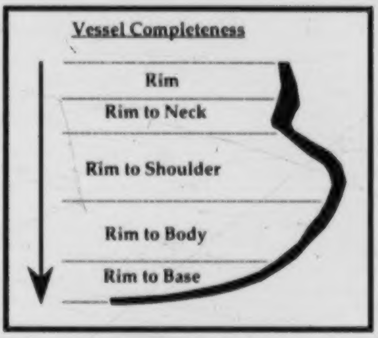


Figure 7.2. Diagram showing vessel portions represented in Table 7.3.

majority of the rim sherd finds came from areas of disturbed context, notably the Reworked Sand deposit and the cultivated site surface (see Chapter 3). The most completely represented vessels came from excavated contexts.

Vessel Analysis Criteria

A number of analytical criteria were used to categorize the identified vessels. These criteria consisted of metric and categorical data reflecting vessel form, decoration, condition, use and disposal. The entire vessel collection was examined using these criteria. While certain types of information could not be gathered from vessels that were incompletely represented, some data were obtainable from all examined remains. The categorical and metrical descriptions for all vessels analyzed for this study are shown in Appendix C.

Although nearly 100 vessels were available for analysis, subdivision of even this many vessels into many defined descriptive categories usually resulted in a very small frequency being tabulated for each category. The small counts per category often precluded the use of statistical tests when comparing categorical data. For example, when category counts fell below five, contingency table analysis (chi-square) could not be reliably undertaken (Freund 1973:323). The recommended procedure to circumvent this problem is to collapse categories to increase frequencies to the required statistical threshold. Therefore, some vessel criteria are expressed using a primary categorical system and a secondary system, which is less precise but likely to be more amenable to statistical testing.

Vessel Form Criteria

Very few detailed studies of Selkirk pottery have dealt with vessel shape and size variability within a Selkirk site assemblage or indeed within an entire Selkirk complex. Original typological classification of Selkirk wares was largely based upon the type of fabric or kinds of decoration impressed on vessel exteriors (MacNeish 1958; Hlady 1971). Real recognition of vessel form variability was brought to the fore with the recovery of many ceramic plates and a few cups and bowls from the Southern Indian Lake region in northern Manitoba (Dickson 1980). In fact, less than half of the 129 vessels from the Kame Hills site were represented by "standard" pots normally considered part of Selkirk assemblages (ibid:50). Nevertheless, all vessels were associated with known Selkirk complexes. Meyer (1978, 1981) was the first to consider vessel form as part of the definition of a Selkirk complex. He used the presence of angular shoulders in combination with a number of decorative attributes to define the Pehonan complex.

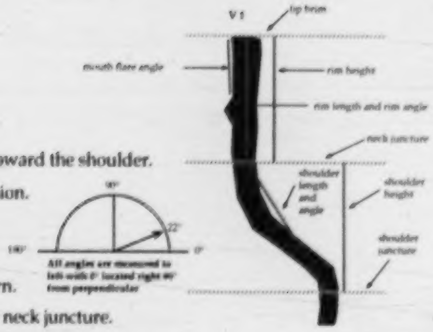
A variety of vessel shapes and sizes are represented in the Bushfield collection (Figure 7.1). These forms appear to coexist within activity complexes, and perhaps represent the remains of a standard vessel "tool kit" found within any domestic living area. The range and variability of such a vessel kit has important implications in determining how ceramics were used on the site, and if certain vessel kits can be used to deduce past human behaviour. Therefore, considerable effort was made to determine the shape and size of each vessel represented in the collection. The form of complete or nearly complete vessels was relatively easy to determine. As has been noted elsewhere (Froese 1985) much greater difficulty is encountered when vessel form must be interpreted solely from rims and rims with necks. Therefore, a number of analytical procedures were developed to gather as much data as possible about an individual vessel, no matter how poorly it was represented.

Block	Rim	Rim-Neck	Rim-Shoulder	Rim-Body	Rim-Base	Total
B 1	3	3	1	0	2	*9*
B 2.1	2	6	1	0	0	*9*
B 2.2	3	5	2	3	1	*14*
B 2.3	1	2	1	1	0	*5*
B 2 General	2	1	1	0	0	*4*
B 3	0	1	0	0	2	*3*
B 3 X	1	0	0	0	0	*1*
B 5	2	0	0	0	1	*3*
B 8	2	1	0	0	0	*3*
B 10	0	1	0	0	1	*2*
B 12	1	0	0	0	0	*1*
B 17	0	0	0	1	0	*1*
Shovel Test	3	0	0	0	0	*3*
Reworked Sand	13	10	1	1	0	*25*
Surface	12	1	0	0	0	*13*
Total	45	31	7	6	7	96
In Situ	17	20	6	5	7	*55*

Table 7.3. Summary of vessel portion recoveries by excavation block, Bushfield West.

Once profile orientations were accurately established, landmark points on each image were identified and measurements and angles obtained (Figure 7.3). These measurements and categories are described below (Table 7.4).

To this end, the shape and size of each vessel was documented in a number of ways.



Landmark Definitions:

Lip Brim - The central surface of the rim lip.
Neck Juncture - The point where the rim begins to curve toward the shoulder.
Shoulder Juncture - The widest point of exterior vessel expansion.

Length/Angle Definitions:

Mouth Flare Angle - The angle from the interior lip edge down.
Rim Angle - The angle of the rim length chord from the neck juncture.
Shoulder Angle - The angle of the shoulder length chord from the shoulder juncture.
Rim Length - The distance from the centre of the neck juncture to the centre of the lip brim.
Rim Height - The vertical distance from the neck juncture to the lip brim.
Shoulder Length - The distance from the centre of the shoulder juncture to the centre of the neck brim.
Shoulder Height - The vertical distance from the shoulder juncture to the lip brim.

Figure 7.3. Diagram showing vessel for landmark locations and metric attribute measurements.

Mouth Flare Angle	-	The angle of the interior lip edge, measured from a horizontal base line.
Rim Angle	-	The angle of the central portion of the rim from the neck juncture.
Shoulder Angle	-	The angle of the central portion of the upper shoulder from the shoulder juncture to the rim juncture.
Rim Length	-	The distance from the centre of the neck juncture to the centre of the lip brim.
Rim Height	-	The vertical distance from the neck juncture to the lip brim.
Shoulder Height	-	The vertical distance from the shoulder juncture to the lip brim.

Table 7.4. Summary of Vessel Form measurements obtained from Bushfield West pottery.

The form of each vessel was rendered using a standardized silhouette profile, obtained using a video camera coupled to a computer (Figure 7.4). The technique resembled that described by Nelson (1985:311-312), with the added advantage that the raw profile could be rapidly shaped and scaled, stored within a vessel data base, and measured directly

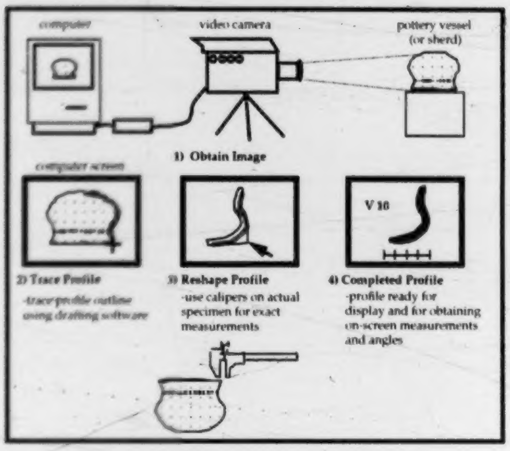

computer
video camera
pottery vessel (or sherd)
1) Obtain Image
computer screen
V 10
2) Trace Profile
-trace profile outline using drafting software
3) Reshape Profile
-use calipers on actual specimen for exact measurements
4) Completed Profile
-profile ready for display and for obtaining on-screen measurements and angles

Figure 7.4. Schematic diagram showing method used to obtain vessel profiles and associated metric data.

from the computer screen in a variety of ways.

Where feasible, measurements of shape attributes were obtained directly from vessel remains. These included rim lip, neck, shoulder and wall thicknesses. A non-metric rim shape category was also devised to account for unusual rim characteristics not amenable to metrical documentation (Figure 7.5). These measurements and categories are described in Table 7.5.

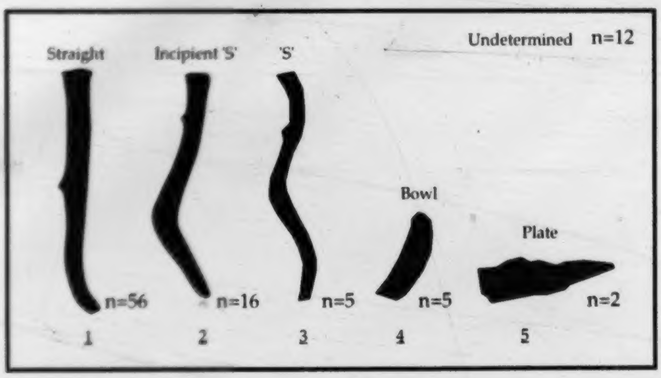


Figure 7.5. Standardized rim shapes of vessels, and their frequencies of occurrence.

For statistical expediency, vessel shape was re-organized into three basic categories: •1) Straight Rim, •2) 'S' Rim (a combination of category 2 and 3 above) and •3) Other Rims (a combination of category 4 and 5 above). All vessels falling within Category 6 (Table 7.5) were eliminated. Combined frequencies were as follows: Straight Rims - 56 vessels; 'S' Rims - 21 vessels; Other Rims - 7 vessels.

Rim diameters were obtained using the widely utilized (Olinyk 1978; Plog 1985) 'A-

Lip Thickness - The average distance from the vessel exterior edge to the vessel interior edge, at the rim lip.

Lower Lip Thickness - The average distance from the vessel exterior edge to the vessel interior edge, between 10 and 20 mm below the rim top (termed the brim).

Neck Thickness - The average distance from the vessel exterior edge to the vessel interior edge, at the neck juncture.

Shoulder Thickness - The average distance from the vessel exterior edge to the vessel interior edge, at the shoulder juncture.

Wall Thickness - The average distance from the vessel exterior edge to the vessel interior edge, at least 20 mm below the shoulder juncture.

Vessel Shape - This non-metric parameter was used to record general rim shape. Six choices were provided: •1) Straight Rim, •2) Incipient 'S' Rim, •3) 'S' rim, •4) Bowl, •5) Plate and •6) Unknown Shape. Figure 7.5 shows the various rim shapes. There is significant variation within each general shape, which is documented by metric attributes Rim Angle and Mouth Flare Angle. A summary of rim shape frequencies for the Bushfield West collection is included in Figure 7.5.

Table 7.5. Summary of Vessel Shape measurements and categories obtained from Bushfield West pottery.

C' formula $C^2 \div 4 \times A + A = D$ where C is the chord distance between the ends of a rim sherd, A is the longest perpendicular distance from the chord to the inner surface of the rim and D is the resultant diameter (Figure 7.6).

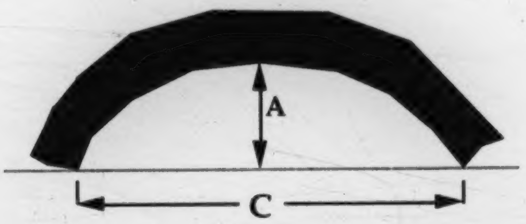


Figure 7.6. Obtaining A and C measurements from a rim sherd section.

This equation was enhanced using the procedure devised by Olinyk (1978) so that standardized error values could be obtained for each measurement. His FORTRAN program source code (ibid:20) was converted to BASIC and used to obtain estimated rim diameters, circumferences and the amount of represented rim used to make the calculation. Each one of these values produced an associated error which was a function of the amount of rim measured. When sufficient profiles were available, neck diameters and shoulder diameters were extrapolated from the rim diameter.

Vessel Decoration

Decorative traits have been the most used criteria for defining Selkirk ceramic assemblages. The most distinctive decorative characteristic of most Selkirk assemblages is the fabric weave pattern impressed as a surface finish on most vessels. Analysis of Selkirk weave patterns have received some attention in the past (Rachin 1960; Saylor 1978), most recently in 1995 (MacLean 1995). On Bushfield West nearly all vessels bore some kind of fabric impression on their exteriors. On some pots the textile imprints were clearly visible; however, in most cases the weave pattern had been smeared or nearly smoothed away. Thus, a detailed classification of textile weaves was not undertaken for this study. Instead, a simple categorical variable was devised to record fabric impression clarity. It is described below. The frequency of occurrence for each category within the Bushfield West collection is shown in Table 7.6.

Classification	Freq	Description
Prominent Fabric	38	Fabric weave is clearly visible over most of the represented vessel, including the body, shoulder and rim area. There has been virtually no attempt to smear the weave pattern, except perhaps in the rim lip area.
Smoothed Fabric	50	Although fabric weave is detectable on the vessel surface, it has been substantially smoothed so that the weave pattern is not easily determined on most parts of the vessel.
No Fabric	8	There is no indication that any kind of weaved covering was impressed on the vessel surface. The surface is smooth and has no perceptible texture.

Table 7.6. Vessel Surface Finish categories for Bushfield West pottery.

Fabric criteria were also organized for statistical purposes in terms of the presence and absence of fabric impressions on a vessel. The two categories were: •Fabric Present (a combination of the first two categories above) and •Fabric Absent (the last category above). The counts for the re-organized categories were: Fabric Present - 88; Fabric Absent - 8.

A second common decoration was the punctate. Punctates were found on 76 vessels (79%). They were usually impressed in a single line on the rim exterior surface between the lip and the neck. On two vessels multiple lines were present, and on two other vessels punctates had been impressed from the rim interior. These exceptions represented approximately 5% of the punctated vessels, and did not warrant specialized criteria to be devised to account statistically for their presence.

A number of metric attributes were established to record punctate dimensions and their situation on the rim of a vessel (Table 7.7).

Punctate Length	The longest distance from one edge of a punctate to its opposite edge. This measurement was averaged over a number of punctates in a line if they were present.
Punctate Width	The shortest distance from one edge of a punctate to its opposite edge. This measurement was averaged over a number of punctates in a line if they were present.
Punctate Depth	The depth of the punctate from the exterior sherd surface to the inner paste surface forming the interior punctate boss. This measurement was averaged over a number of punctates in a line if they were present.
Punctate Spacing	The distance from the centre of one punctate to the centre of an adjacent punctate. This measurement was averaged over a number of punctates in a line if they were present.
Distance Below Lip	The perpendicular distance from the centre of a punctate to the outer edge of the rim lip. This measurement was averaged over a number of punctates in a line if they were present .

Table 7.7. Punctate measurements obtained from Bushfield West Pottery.

Sixty-nine vessels from the Bushfield West collection (72%) bore some form of decoration on the rim lip, the only other area in which significant decorative traits appeared on any of the vessels. Most of this decoration consisted of cord-wrapped-tool impressions on either the outside or inside of the lip, or running across the brim. There was some variation: several sherds had stamps or shallow punctates impressed on the lip brim, while a few others displayed lip notching or parallel incising along the brim. In general, there seemed to be little pattern to the kinds of decoration being applied, and relatively little variability.

Significant variability was observed, however, in the placement of various decorative marks on the rim. The three rim areas were the exterior lip, interior lip and the lip brim (centre line between exterior and interior). Decoration usually occurred in one of these three areas, although impressions were made in a combination of areas for a number of vessels. Accordingly a variable documenting the position of lip decoration was devised, consisting of nine categories. Category descriptions and their frequencies of occurrence are shown in Table 7.8.

This exhaustive breakdown proved to be too fine for statistical application. Consequently, a secondary set of criteria were devised which consisted of three categories. They were •Exterior Decoration, •Other Lip Decoration and •No Lip Decoration. Retabulated frequencies were: Exterior - 35; Other Lip - 34 and Undecorated - 26.

A normally very rare decorative attribute occurred with great frequency on many of the Bushfield West vessels. This trait consisted of visible fingerprints that had been

Category	Freq.	%
Lip Exterior	35	51
Lip Interior	6	9
Brim	16	23
Exterior/Brim	2	3
Brim/Interior	1	1
Exterior/Interior	8	12
All parts of Lip	1	1
Total Decorated	*69*	*100*
Undecorated	26	-
Indeterminate	1	-

Table 7.8. Lip Decoration Categories and Frequencies of Bushfield West pottery.

impressed directly into the malleable paste during vessel shaping. All prints were found on the vessel interiors, on or in the vicinity of bosses formed when punctates were placed on vessel exteriors. The significance of fingerprint analysis for the study of Bushfield West intrasite behaviour has been discussed elsewhere (Gibson 1986a; Gibson and Stratton 1987). Preliminary analysis has shown that it is possible to correlate specific vessels with individual potters; however, this research remains to be pursued as of this writing and is not included as part of this study. Nevertheless, the presence of fingerprints is in itself an unusual trait which may have been used as a form of decoration in some cases. Therefore, rather than simply recording the presence and absence of fingerprints, some attempt was made to distinguish between those prints that were purposefully impressed into the clay as a decorative mark, and those which were fortuitously made as a consequence of the pot molding process. Three categories of fingerprint clarity were recognized for those vessels which yielded prints, plus two more for non-print vessels and vessels which had no punctate bosses (Table 7.9).

Based upon the above criteria, vessels bearing the first choice (Clear Prints) were the most likely to have been purposefully decorated with fingerprinting. The second two choices (Smeared Prints and Print Traces) probably were formed as a consequence of impressing punctates into the paste. They are more fully considered as part of vessel manufacturing behaviour rather than vessel decoration behaviour.

Recombination of these categories produced a second set of criteria consisting of two categories: •Prints and •No Prints. Their counts were Prints - 36; No Prints - 42. Ineligible vessels were deleted from the sample. These recombined criteria were felt to be more useful in testing hypotheses about vessel paste condition, as explained in more detail below.

Classification	Freq	Description
•Clear Prints	17	Fingerprints are clearly visible in normal lighting conditions. Whorls and loops are often clearly defined and potentially can be used for comparison between vessels.
•Smeared Prints	10	Fingerprints can be delineated on many bosses, but they are deformed by smearing or incomplete impressing. They are not always visible under natural light conditions.
•Print Traces	9	Occasional print whorls are visible on portions of a few bosses, but only after careful inspection under intense lighting.
•No Prints	42	No visible fingerprints were found anywhere on the vessel.\
•Ineligible Vessels	18	There is insufficient boss surface available, or no bosses are present to bear visible prints.

Table 7.9. Fingerprint Clarity of Bushfield West pottery.

Vessel Disposal

Disposal mode was determined by directly examining vessel remains as they were recovered from the occupation surface. Vessel disposal was directly related to the dispersal of crossmended pottery sherds, and was strongly dependent upon the "conjoinability" of these sherds as they were recovered on the living floor.

Vessel dispersal was difficult to classify objectively . However, six categories of dispersal were defined, based upon the clustering of vessel pieces on the living floor (Figure 7.7, Table 7.10).

The recovery classification was also reorganized for statistical study. It was reduced to three categories: •Clustered (a combination of categories 1, 2 and 3 above);

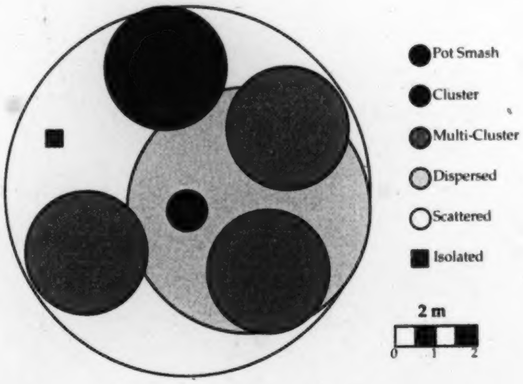


Figure 7.7. Relative areas represented by vessel dispersal categories.

Classification	Freq	Description
•Pot Smash	3	At least 75% of the represented pieces of a vessel were found on the living floor within an area of 1 m diameter. No other pieces of the vessel were found elsewhere, and the vessel was almost entirely represented.
•Cluster	27	At least 75% of the represented pieces of a vessel were found on the living floor within an area of 3 m diameter.
•Multi-Cluster	3	At least 25% of the represented pieces of a vessel were found on the living floor in each of two or more non-overlapping 1 m diameter areas.
•Dispersed	1	Vessel pieces were found unclustered on the living floor within an area of 6 m diameter.
•Scattered	7	Vessel pieces were found unclustered on the living floor beyond an area of 6 m diameter.
•Isolated	55	Single sherds found on the living floor which have no crossmends, or sherds found out-of-context.

Table 7.10. Vessel Dispersal categories for Bushfield West pottery.

•Unclustered (a combination of categories of 4 and 5 above) and •Isolated (category 6 above). The new frequencies were: Clustered - 33; Unclustered - 8; Isolated - 55.

Vessel Manufacture

Ceramic vessels from Bushfield West were subject to a wide range of manufacturing conditions that imposed considerable compositional variability on each pot. This variability has been studied by Hanna (1983) who notes that vessel manufacturing characteristics and compositional properties can furnish information about the the seasonal round of a potter's social group, the proficiency of a potter and the use for which a potter was intending to make of a vessel. The Bushfield West ceramic assemblage exhibited considerable variability in paste composition. Several paste analysis research programs were initiated in 1985 and 1988 following along the lines suggested by Hanna (1983). Preliminary paste composition studies using Instrumental Neutron Activation Analysis techniques were carried out on one Bushfield West vessel, yielding promising results (Malainey 1985). Other materials analysis studies were initiated by M. Tisdale in 1988 and Malainey in 1993. Data from Malainey's work (concerned with paste residue analysis) has just been released, and will be dealt with in Chapter 9.

In the absence of a rigourous analysis with which vessel composition criteria could be formulated, a simple, subjective category reflecting general vessel integrity was devised. This category was based on each vessel's paste density, the tendency for the paste to spall or fragment and the homogeneity of the temper within the paste (Table 7.11). These criteria did not require recombination for statistical study.

As discussed above, the three fingerprint clarity criteria may have some relevance in the characterization of paste condition, especially at the time the vessels were decorated. Two fingerprint criteria, 'Smeared Prints' and 'Print Traces', apparently were formed as a consequence of impressing punctates into a vessel's paste. The 'Smeared Prints' criterion may reflect a paste which was pliable and somewhat plastic at the time of imprinting. During punctate boss formation, the potter may have twisted her finger, or trailed it over to the next punctate position. In either case, the prints were deformed or nearly obliterated. 'Print Traces' may have been formed by the same method, except that the bosses were purposefully smoothed after their formation. 'No Prints' may have been the product of relatively non-plastic paste being impressed with punctates. In such cases, no prints would be left behind. Theoretically, these hypotheses can be tested by comparing print clarity with paste composition criteria.

Classification	Freq	Description
•Good Paste	39	The paste is dense, well-consolidated and shows very little spalling on the interior or exterior. Mended sherds fit precisely together and do not crumble around the edges. When handled, vessel sherds do not disintegrate and temper does not fall out of the paste.
•Moderate Paste	38	The paste is moderately dense but shows some spalling on the exterior and/or interior. Mended sherds exhibit some edge abrasion, but fit together well. When handled, a small bit of temper may occasionally fall out of the paste
•Poor Paste	19	The paste appears to be poorly consolidated and does not appear to be very dense. Considerable spalling and surface exfoliation is apparent. Mended sherds are sometimes hard to keep together, tending to break away at the glued joins. The paste tends to shed temper.

Table 7.11. Vessel Paste Condition of Bushfield West pottery.

Fingerprint criteria may not completely reflect paste condition, however. 'Clear Prints' may be functionally associated with the condition of a potter's finger tips as well. It has been suggested that younger individuals often leave clearer prints than older people, simply because they have not spent as many years working with their hands and wearing away print-bearing finger pads (RCMP Identification Section, Edmonton, personal communication, 1987). Thus the clear prints may be entirely, or partially, attributable to one or more younger individuals decorating pots, and non-fingerprint bearing vessels may have been decorated by older potters.

A second compositional characteristic of each vessel was its unique colour. Bushfield West pots were not painted, although several may have been stained with red ochre, either purposefully or through use. Their colours varied from black through to a very light yellow approaching white. In fact, most vessels could not be said to have been a uniform colour, since lighter coloured vessels usually bore dark stains and occasional charred spots, and darker vessels light tan patches. As a consequence, the objective determination of colours through reference to standardized colour charts could not be reliably undertaken, as recommended by Rye (1981:119). Nevertheless, a modal chromatic hue was subjectively determined for each vessel, using a simple graded range of criteria (Table 7.12).

For statistical expediency, the six colour classes were recombined into two very simple hue categories: •Dark (a combination of the first three categories) and •Light (the last three categories combined). Frequencies for the two categories were: Dark - 60; Light - 36.

Classification	Freq	Description
•Black	3	The majority of the vessel exterior is black coloured. The interior may be blackened grey.
•Blackened Grey	26	Much of the vessel exterior is black, with a number of lighter grey or tan patches which give it a greyish overall appearance. The interior may be greyish tan colour.
•Grey Tan	31	The vessel exterior is a dark tan or brown colour with considerable dark staining. The interior may be tan coloured with some darker staining as well.
•Tan	14	The vessel exterior and interior are a light brown or tan colour. Only a few darker stains are present.
•Orange/Yellow Tan	21	The vessel exterior is a light tan, exhibiting a few yellow or light orange patches. The interior may be even lighter coloured.
•White	1	The vessel exterior and interior are a very light cream colour, approaching white.

Table 7.12. Vessel Colour Classification of Bushfield West pottery.

Vessel Use Through Residue Analysis

It is normally difficult to determine how a pottery vessel was used even when it has been largely reconstructed. Interpreting pot use from vessel portions yields much more ambiguous results, a situation which probably explains why pottery use analysis has never been undertaken on Selkirk pottery. Yet, understanding specific pot function is intrinsic to interpreting why particular kinds of pots were used on a site, and in particular areas of a site. How a pot was used can help explain the kinds of food being consumed on a site, the kinds of activities taking place, and may be reflected in the very styistic appearance of the vessel (Skibo 1992: 4, 5).

It has been observed that pot function should be extended beyond the utilitarian role assigned to it: a vessel may be used for cooking, but it may also be used simultaneously as a symbolic artifact imbued with stylistic attributes of social and ideological implication (Sackett 1977:370; Skibo 1992: 33, 34). For the moment, utilitarian function, or "technofunction" (cf., Skibo 1992:33) will be addressed. In determining specific pot technofunction, Skibo (1992) suggests several advantages that such an endeavour can provide. For example, studying technofunction can determine if pots were used for more than one function (i.e., cooking *and* storage), or if specific pots were used for different purposes throughout their use-lives (ibid.: 38).

Pot technofunction can be determined by studying pot use alteration, principally in the form of ceramic surface abrasion and accretion. Surface abrasion is represented by pitting of a pot's interior surface, and has been interpreted to be caused by stirring and scraping, or by chemical breakdown (Hally 1983 a,b) Surface accretion consists of the deposition of carbon on the interior and exterior of a vessel by charring of food or through sooting from an open fire. It can also consist of organic residue accumulation, principally on a vessel's interior, as the result of heat-related food staining and encrustation (Skibo 1992:38-42; Hally 1983b)

On Bushfield West the majority of vessel remnants bore evidence of specialized technofunctional use. There was little observable evidence of decremental use alteration. Although scraping was apparent on the interiors of some vessels, that kind of alteration appeared to be related to manufacture, and not post-manufacture usage.

Presence of soot on vessels could not be categorized in any satisfactory way. In fact, sooting may have contributed signficantly to determination of the Colour category, rendering colour not so much a factor of manufacturing as of post-manufacture useage.

All use alteration evidence consisted of the presence of surface accretions, in the form of stains and residues that were encrusted on, or discoloured the interior and exterior parts of many pots. It is suggested that the residues and stains can be attributed to the vessels being used to heat or contain water, food and pigment. This hypothesis can be explored by examination of the degree of residue formation on individual vessels.

At the primary stage of identification, in the laboratory, residue classification consisted of developing four basic criteria of vessel residue formation. A fifth classification was devised to include vessels that were insufficiently represented to determine overall residue characteristics (Table 7.13).

For some statistical purposes, the above criteria were slightly reformulated to form three pot use categories. These were: •Heavy Residue (a combination of categories 1 and 2 above); •Light Residue (category 3 above) and •No Residue (category 4 above). Pots of indeterminate residue characteristics were eliminated from the sample. Frequency counts for the new categories were: Heavy Residue - 38; Light Residue - 14 and No Residue - 29.

Classification	Freq	Description
Heavy Residue	27	Thickly deposited cooking residue covers more than 25%, or thin residue covers more than 50%, of the rim, neck and shoulder area, both on the interior and the exterior.
Moderate Residue	11	Thickly deposited cooking residue covers less than 25%, or thin residue covers less than 50%, of the vessel exterior and interior.
Light Residue	14	No thick cooking residue is visible and very few dark, thin residue stains are apparent. Brown and yellow stains are visible on the interior, and carbon stains and heat discolouration are evident on the vessel exterior.
No Residue	29	Few or no carbon stains are present, and no evidence of heat discolouration is apparent. Pigment staining may be visible on the exterior and interior of the vessel.
Unknown Residue	15	Vessel remains are too small to interpret.

Table 7.13. Vessel Residue Formation Categories for Bushfield West pottery.

Summary

The sample of pottery remains from Bushfield West has been categorized into a variety of metric and non-metric classifications. The most significant classifications deal with vessel form and function. The adoption of vessel function (primarily through vessel residue characteristics) as a means of focusing upon ceramic variability within Bushfield West (or any Selkirk site for that matter) is not an easy endeavour. Determination of functional variability must be based on the limited evidence that is available from the recovered remains. Despite the expressed confidence in identifying the inhabitants of the site as being Cree, there are virtually no ethnographic data which make reference to pottery use by these people, nor for any human groups in the forests of Western Canada. Thus, analogies from pottery users from elsewhere must be used. Even these analogies must be carefully evaluated, because there are significant differences in the pottery assemblages apparent between Selkirk and other more well understood North American archaeological complexes even without any kind of detailed analysis. Most obvious is the lack of vessel shape variability, as only three basic vessel forms, the pinched jar, bowl and plate, can be identified. Of these, plates appear to be restricted to certain areas of northern Manitoba, and bowls are extremely uncommon, making up less than 5% of any pottery assemblage. In fact, only pinched jars make up the *in situ* assemblage from Bushfield West.

Nevertheless, in the following chapter, form and function ceramic data (as well as some decorative data) will be analyzed in depth to determine if any patterning is present in the identified attributes, and if so, how it can be applied to the behavioural patterning identified in various parts of the Bushfield West site.

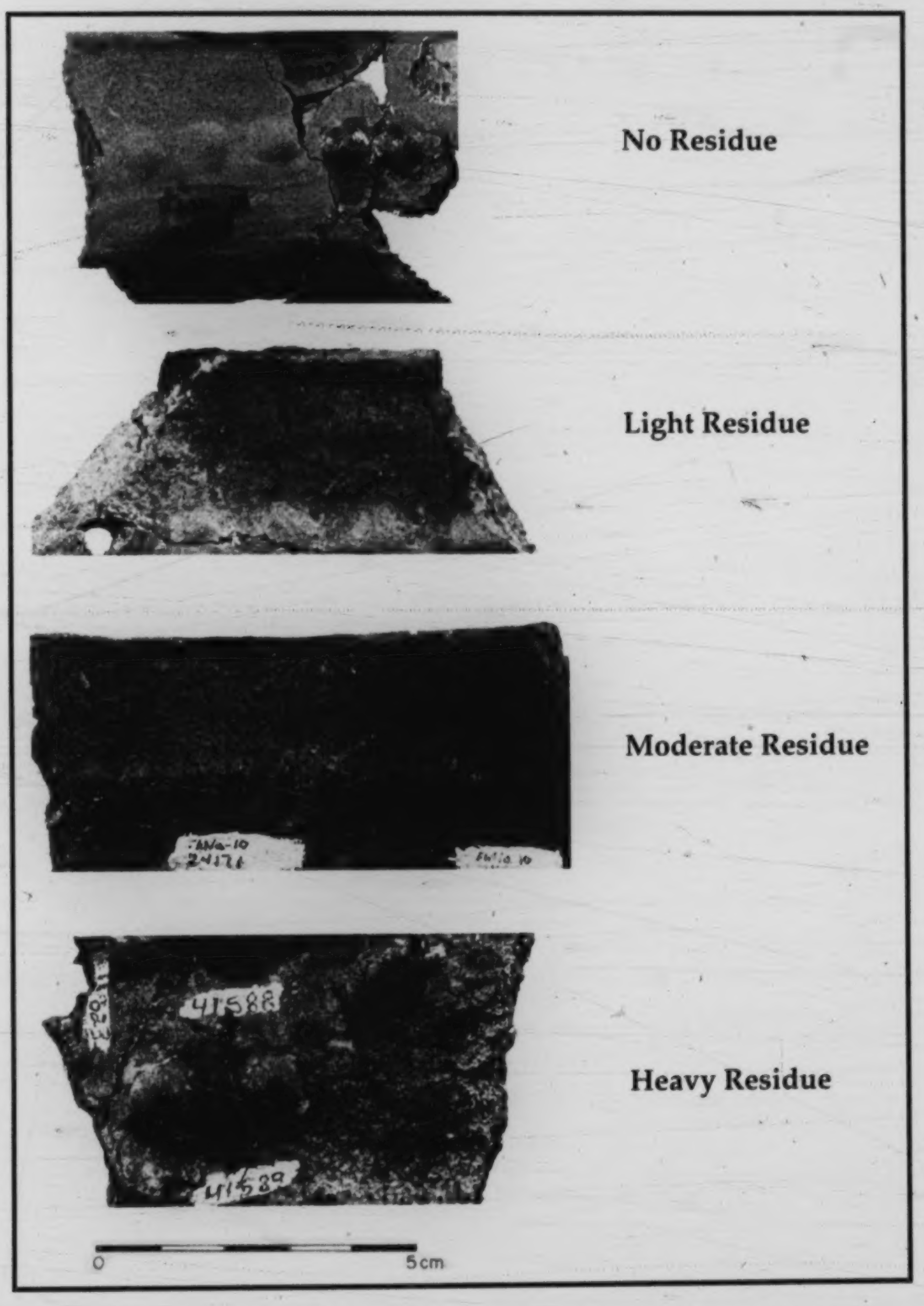


Figure 7.8 Examples of residue found on ceramic vessels on Bushfield West.

Chapter 8

CHARACTERIZING THE CERAMIC RECOVERIES

INTRODUCTION

The preceding chapter provided a summary of the 96 vessels recovered from Bushfield West. Although many of these vessels were recovered out of context, it has been suggested that all were manufactured by individuals who were members of a single social group (probably a band), which occupied the site discontinuously for several years. Given that hypothesis, it is reasonable to treat the vessel collection as a representative sample of the entire vessel assemblage used by that group. Thus, certain characteristics of the collection which can be inferred from the sample might shed light on the reasons for ceramic variability within a single assemblage of clay pots.

Thirty-two variables were used to describe widely differing characteristics of the Bushfield West ceramic assemblage. Although it was theoretically possible to compare directly every variable to another, and to perform multivariate analyses to isolate co-varying variable sets, practically this was not a feasible approach for this sample. Although upwards of 100 vessels were available for study, nearly all were incompletely reconstructed and a substantial portion were represented only by rim sections. Thus, only a few variables could be examined on a majority of the vessels, even after the original variable categories were reduced in size for statistical manipulation. Consequently, it seemed inappropriate to use complex statistical patterning studies on a collection which was statistically inadequate for most tests.

Of course, statistical inadequacy is the rule rather than the exception for most intra-site artifact analyses. Much of this phenomenon is attributable to the nature of archaeological remains, which are partial recoveries of material deposits which have been only partially preserved through time. When one considers that the scant recoveries themselves are an erratic reflection of constantly-changing past human behaviour, it is apparent that archaeological remains are not purposefully selected or sampled populations of a larger population, but rather chance recoveries, referred to as "target populations" (Doran and Hodson 1975:95).

Thus, the 96 vessels analysed in this study comprise this target population, a kind of sample to which limited statistical treatment can be applied. As Doran and Hodson (1975:96) point out:

> ...[archaeologists] may be able to delimit a meaningful 'people' by classifying material remains...[but they]...cannot pretend to obtain a random sample of its relevant surviving material...[They] can select material...that is relevant to a meaningful target population, but [they] cannot establish mathematical links between the two. The situation must be treated as one where a finite population is studied in toto and where, consequently, probabilistic methods, like significance tests, are of limited relevance. Statistical procedures [can] be used to describe and summarize data and to suggest hypotheses, but not to estimate parameters of hypothetical parent populations, the context for standard statistical theory.

These ideas are particularly relevant in the case of Bushfield West, which produced one of the most complete single component ceramic assemblages in western Canada. Nevertheless, as large as this collection is, it is an incompletely represented portion of the entire site vessel assemblage, which in itself is only one aspect of the broad spectrum of Selkirk ceramics. Thus, the following analyses deal with the Bushfield West pottery as a target population only, and have no statistical relevance to other collections of vessels which may resemble this assemblage.

Ceramic Variable Analysis

The 32 variables defined for vessel analysis vary in their importance for the goals of this study. After reflection, I decided that the explicit goal of defining "vessel behaviour" within Bushfield West could best be addressed by placing particular emphasis on several critical ceramic variables related to the functional use of pottery on the site. As explained in the previous chapter, interpreting pottery function can help to explain a variety of behaviours taking place in an activity area in which pottery is found, and can also help in the investigation of stylistic and technological variability expressed in the sample (Hally 1986:267). Unfortunately, there has been very little attempt to study Selkirk ceramic recoveries from the point of view of vessel use. In fact, most archaeologists who study Selkirk remains seldom contribute any information in ceramic discussions about what they believe any particular vessel was used for. Yet, studies elsewhere (e.g., Hally 1986; Skibo 1992), have suggested that the determination of ceramic use is as important in intra-site interpretation as the determination of stylistic attributes when inter-site studies are carried out.

It was implied in the previous chapter that vessel use could be directly associated with degree of vessel residue formation on specific pots. Following this line of investigation, five categories of residue formation were determined for every vessel recovered from Bushfield West. These categories, described in the preceding chapter, were Heavy Residue, Moderate Residue, Light Residue, No Residue, and vessels with Indeterminate Residue formation. Taken as an independent variable, deduced ceramic residue formation was compared with nearly all other ceramic variables in an effort to determine if residue formation could be attributed to some ceramic variability exhibited within the assemblage.

Two separate statistical analyses were carried out. One made use of the original four formally defined variables (vessels of indeterminate residue formation were removed from the sample because of inadequate data) and the second study addressed a second variable set in which vessels exhibiting Heavy and Moderate residue formation were collapsed into a single category termed "Heavy Residue". In almost all cases, the results derived from the first study were ambiguous, a result of the poor sample sizes represented for heavy and moderate residue-bearing vessels. Consequently, the following discussion is based on data gained from the second analysis.

For attribute data, contingency tables were used to compare residue analysis category frequencies with other variable categories. The chi-square and correlation coefficient was calculated for each table (where amenable) and tested against a null hypothesis formulated for each specific test. Metric data, being measurements, were compared in terms of data distributions, using t-tests to compare distribution means, where amenable.

Residue analysis studies produced significant results in two major categories of vessel description: vessel construction and vessel form.

Vessel Construction

Vessel construction was addressed by two attribute variables: paste condition and paste colour.

Paste Colour - Determination of paste colour was established as a separate observational category from the presence of soot on the exterior of a vessel, or of encrusted carbon on its interior. These deposits generally made a vessel paste appear to be dark in colour, although they tended to be patchy in distribution, appearing with most frequency in the rim or shoulder area of a pot. Whether paste colour was in fact independent of interpreted function (as implied by the presence of soot or residue) required a statistical test for validity, done by determining if there were other factors which could account for colour differences between pots. The most obvious avenue of inquiry was to determine if paste condition and colour yielded some sort of relationship, addressed by constructing an hypothesis that no relationship existed between the two variables, then performing a simple chi-square statistical test (Table 8.1).

	Good	**Moderate**	**Poor**	**Total**
Light	6	18	12	36
Dark	33	20	7	60
Total	39	38	19	96

X^2=15.04 DF=2 CV=5.99 NH rejected

Table 8.1. Paste Condition versus Paste Colour.

The test indicated that, on the contrary, there was a relationship between paste condition and colour: higher quality (i.e., denser) paste appeared to be darker. The reason for this correlation was not immediately apparent, but continued investigation of paste condition vis-à-vis vessel use was undertaken.

Paste Condition - Based on a sample population in which 81 vessels could be compared, Paste Condition and degree of Residue Formation were examined with the null hypothesis being that there was no relationship between the variables (Table 8.2). Unfortunately, the chi-square statistic could not be applied reliably to the relationship because

	Heavy Residue	Light Residue	No Residue	Total
Good	25	8	4	37
Moderate	13	4	16	33
Poor	0	2	9	11
Total	38	14	29	81

X^2=24.28 DF=4 CV=9.49 Test invalid

Table 8.2. Residue Formation versus Paste Condition.

more than 20% of the expected frequencies (2 of 9 cells) were less than five (Freund 1973:323; Sharp 1979:188). However, the data presented in Table 8.2 suggest that vessels with no residue were rarely composed of good paste, and that a large number were composed of poor paste. This proportional trend was reversed for pots with heavy residue, as the majority exhibited good quality paste, and none were composed of poor paste. Pots with light residue appeared to be composed predominantly of moderate quality paste, with only two consisting of poor paste.

Some kind of relationship between vessel residue formation and paste condition was apparent, in that vessels that exhibited heavy residue were composed of higher quality pastes than vessels which exhibited no residue. The problem of low cell frequencies was addressed by collapsing the Heavy and Light Residue categories into a single category called Residue Present. Testing this category against Paste Condition with chi-square, the hypothesis of no relationship between vessel paste condition and the presence of residue was rejected (Table 8.3).

	Residue Present	Residue Absent	Total
Good	33	4	37
Moderate	17	16	33
Poor	2	9	11
Total	52	29	81

X^2=22.50 DF=2 CV=5.99 Rejected

Table 8.3. Residue Formation versus Paste Condition.

Vessel Construction Hypotheses - Analysis of paste characteristics of pottery from Bushfield West demonstrated that there was a statistically observable relationship between colour and paste condition, and between paste condition and presence of residue, as summarized below:

1) Vessels with better consolidated pastes are generally darker in colour

2) Vessels exhibiting residue on Bushfield West are composed of a better-consolidated paste than those exhibiting no residue.

3) Vessels exhibiting residue on Bushfield West have a darker coloured paste than those exhibiting no residue.

An independent check of Hypothesis 3 (a corollary of Hypothesis 1) regarding colour and pot residue formation was undertaken. Through formulation of a null hypothesis that stated that vessel residue had nothing to do with whether a vessel's paste was light coloured or dark coloured, a contingency table was constructed from the Bushfield West vessel collection (Table 8.4). Not unexpectedly, contingency data yielded a chi-square statistic of 47.98. At 2 degrees of freedom, this value was well beyond the critical chi-square distribution value at 0.05 level of significance of 5.99 (Freund 1973:477). This result necessitated the rejection of the hypothesis of non-association, in turn suggesting that there was some form of correlation between a vessel's colour and if it exhibited residue formation.

	Heavy Residue	Light Residue	No Residue	Total
Light	1	3	24	28
Dark	37	11	5	53
Total	38	14	29	81

X^2=47.98 DF=2 CV=5.99 NH rejected

Table 8.4. Residue Formation versus Paste Colour.

The hypothesis was reformulated. Heavy Residue and Light Residue vessel categories were again combined into a Residue Present category and re-tested against the hypothesis that there was no relationship between the presence of residue and paste colour (Table 8.5).

The hypothesis was rejected. Paste colour was darker for vessels with residue than vessels without residue. With this demonstrated, another Hypothesis was formulated:

4) Vessel paste colour and consistency is largely a function of whether the vessel exhibited residue or not.

Again recalling the idea that vessel use can be directly associated with degree of vessel residue formation on specific pots, it is possible to expand the utility of Hypotheses 2, 3 and 4 by reformulating them in terms of Vessel Use. The premise is that residue formation can be correlated with vessel function as follows:

	Residue Present	**Residue Absent**	**Total**
Light	4	24	28
Dark	48	5	53
Total	52	29	81

X^2=46.38   DF=21   CV=3.84   Rejected

Table 8.5. Residue Formation versus Paste Colour.

Heavy Residue	<->	Heavy Cooking
Medium Residue	<->	Light Cooking
Light Residue	<->	Boiling
No Residue	<->	Utility Use (non-heating/utility storage)

With these relationships made, reformulated Hypotheses are presented:

2A) Vessels that were used for heating purposes (cooking and boiling) on Bushfield West are composed of a better-consolidated paste than those utility storage.

3A) Vessels that were used for heating purposes (cooking and boiling) on Bushfield West have a darker coloured paste than those used for utility storage.

4A) Vessel paste colour and consistency is largely a function of whether the vessel was used on a fire, or used for non-heating purposes.

a) Heating a vessel darkened and hardened its paste.

b) It is probable that all vessels, immediately after initial fire-hardening, were approximately the same colour and nearly all would have had the same consistency of paste.

The vessel use classification scheme based on these reformulated hypotheses provides an extremely useful means of summarizing the uses made of the identified remains. In fact, it is the primary variable used in determining ceramic use variability on Bushfield West. The implications of these hypotheses will be discussed below.

Vessel Form

Vessel form was represented by 13 measured variables. A few measurements, like lip thickness, could be obtained from nearly every represented vessel of the sample population, while some measurements were very poorly represented. The frequencies of vessel form attribute measurements are summarized by the categorical framework of inferred Vessel Use (Cooking, Boiling and Utility) in Table 8.6. Since the measurement data were continuous in form, the mean of each attribute distribution was calculated for that data

Variable	Cooking	Boiling	Utility	Total
Rim Angle	23	10	19	52
Mouth Flare	23	10	20	53
Lip Thickness	38	14	27	79
Low Lip Thickness	38	14	27	79
Neck Thickness	23	10	15	48
Shoulder Thickness	8	4	8	20
Wall Thickness	8	3	8	19
Average Thickness	38	14	27	79
Rim Diameter	23	10	20	53
Neck Diameter	19	8	16	43
Shoulder Diameter	8	4	9	21
Rim Height	22	9	19	50
Rim Length	22	9	19	50
Shoulder Height	7	4	7	18

Table 8.6. Vessel frequencies used to calculate mean measurements of selected vessel form variables. See Table 8.7 for variable means.

set. The means by inferred Vessel Use are shown in Table 8.7.

Vessel Size - An important part of the general vessel analysis was to determine the average vessel size of the Bushfield West target population, and to determine if the size varied significantly with inferred vessel use. Normal criteria used to describe vessel size, such as volume and height, could not be used because of the fragmentary nature of most of the vessels. So few vessels were reconstructed from rim to base that height was not even included as part of vessel form description. Although vessel girth at the shoulder could be estimated for 21 vessels, the lack of complete form data precluded a reliable estimation of volume for any particular pot. The most frequently represented measurement which could be used to estimate vessel size was Rim Diameter. Fifty-four vessel rims were large enough to be measured using the A-C method (see previous chapter), and 53 could be categorized by use.

The three primary use categories (Cooking , Boiling and Utility) yielded three distinct rim diameter means (in cm, Table 8.7): Cooking = 16.31 [n=23]; Boiling = 12.00 [n=10] and Utility = 14.29 [n=20]. T-test hypotheses stating that each one of these inferred Vessel Use category means did not significantly depart from one another or from a hypothetical population of pooled means (Thomas 1986:235-240) were prepared. The statistical tests could find no significant variation between the means. However, problems with sample sizes (particularly that of boiling vessels) and the inferred relationships

Variable	Cooking	Boiling	Utility
Rim Angle (°)	80.52	87.50	87.32
Mouth Flare	93.77	97.00	94.84
Lip Thickness (cm)	0.83	0.70	0.76
Low Lip Thickness	0.64	0.58	0.59
Neck Thickness	0.76	0.66	0.66
Shoulder Thickness	0.54	0.60	0.60
Wall Thickness	0.41	0.35	0.49
Average Thickness	0.72	0.63	0.67
Rim Diameter	16.31	12.00	14.29
Neck Diameter	15.95	13.90	14.94
Shoulder Diameter	19.33	20.23	13.30
Rim Height	4.04	2.88	3.51
Rim Length	4.15	2.91	3.52
Shoulder Height	4.74	3.85	2.99

Table 8.7. Mean measurements of selected vessel form variables. See Table 8.6 for counts.

of vessel categories to the hypothetical vessel population indicated that the statistical results were probably unreliable. Examination of the distribution of rim diameters for each vessel class indicated certain trends that were more illuminating. The rim diameter distributions for each inferred Vessel Use class plotted by common percentile (based on relative frequency) are shown in Figure 8.1.

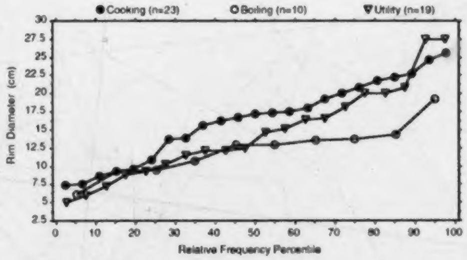


Figure 8.1. Inferred Vessel Use plotted against Rim Diameter.

The distribution suggests that rim diameters for all three classes of vessels vary little when they are small. However, as vessels become larger, diameters begin to diverge, with cooking and utility vessels becoming progressively larger in diameter in proportion to boiling vessels. Quantile-Quantile (Q-Q) plots were used to compare directly frequency distributions of the inferred Vessel Use categories. The quantile of a sample is the data point corresponding to a given fraction of the data, and looks much like a cumulative curve or ogive. Generally, ogives refer to proportional change, but they also can be calculated in terms of absolute frequency (Thomas 1986:52). QQ Plots relate two sample distributions. If both sets of data are from the same sample population, the QQ graph line should be straight. QQ Plot comparisons of cooking, boiling and utility vessel diameters support the hypothesized general split between the vessel class sizes as suggested by Figure 8.1. This result is illustrated in Figure 8.2; cooking pot diameters become larger than boiling vessels when diameters exceeded 10 cm. Utility vessels display the same size increase at 13 cm diameter (Figure 8.3). Utility and cooking pots are not as easily differentiated (Figure 8.4). Their diameters appear to have been roughly proportional for all rim sizes. Nevertheless, based on the sample of 10 boiling vessels, the largest boiling pots displayed a diameter between 6 and 10 cm less than cooking and utility vessels.

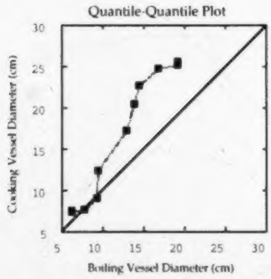


Figure 8.2. QQ Plot of Cooking vs. Boiling Vessel diameters.

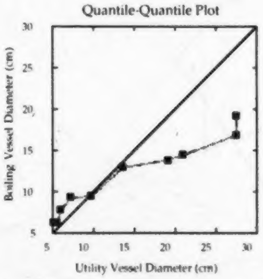


Figure 8.3. QQ Plot of Boiling vs. Utility Vessel diameters.

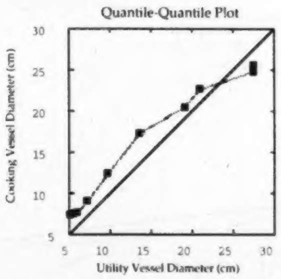


Figure 8.4. QQ Plot of Cooking vs. Utility Vessel diameters.

Vessel Shape - Shape variability was investigated using a number of angles and lengths measured on various vessel parts; some measurements were redundant. Rim Height varied little from Rim Length, and since the former was also based on an angle measurement, it was seen to be less accurate than Rim Length and thus was not examined in detail. Mouth Flare, which measured the eversion of a vessel's lip away from its Rim Angle, was studied in some detail. A statistic based on the difference of Mouth Flare and Rim Angle was derived and compared between vessel use classes. No significant correlation was evident. Since the measurement often varied significantly on various portions of a single rim, it was not believed to be a very useful or reliable variable for describing vessel form. Shoulder height, measured only on 18 vessels, was felt to be too small a sample to be useful in describing the site vessel target population.

Two of the best represented metric variables were Rim Angle (n=52) and Rim Length (n=50). A percentile comparison of the Rim Lengths of cooking (n=22), boiling (n=9) and utility (n=19) vessels was made and is shown in Figure 8.5. The means of these three distributions, and the information from the figure indicated that vessels with inferred cooking use had the longest rims (mean=4.15 cm), followed by utility pots (mean=3.52) and boiling vessels (mean=2.88). Direct comparisons using QQ Plots verified these findings (Figures 8.6, 8.7 and 8.8).

The individual plots suggested that, unlike the data for rim diameter, rim length was not as clearly defined by vessel use, and that the means could not be used to differentiate vessel use by rim length. This observation was verified by the results of comparative t-tests of each distribution, even with pooled statistics. The only observable trend was that

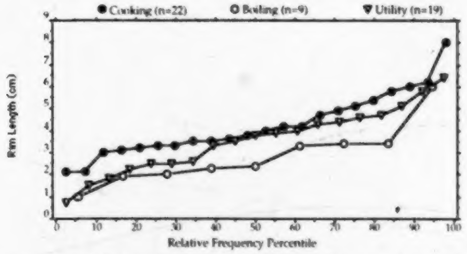


Figure 8.5. Inferred Vessel Use plotted against Rim Diameter.

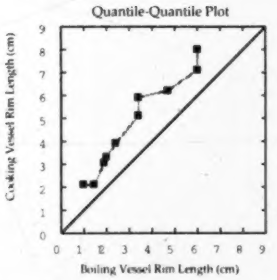


Figure 8.6. QQ Plot of Cooking vs. Boiling rim lengths.

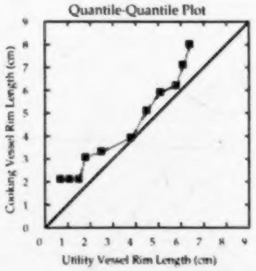


Figure 8.7. QQ Plot of Cooking vs. Utility rim lengths.

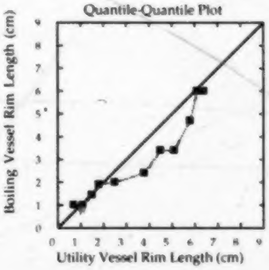


Figure 8.8. QQ Plot of Boiling vs. Utility rim lengths.

cooking vessels had a rim height that consistently varied between one and two cm greater than that of boiling vessels (Figure 8.6). Other vessel use comparisons (Figures 8.7 and 8.8) showed no predictable pattern, other than that cooking vessel rims were possibly slightly longer than utility vessel rims.

Given the above data, it can be argued that the difference in rim lengths between classes of vessels was largely a function of vessel size (i.e. shorter rims were found on smaller vessels). This was not always the case, however, since some rims of small vessels were unusually long, and some rims of large vessels were very short. The effect of vessel size on rim length measurements was most easily factored by obtaining the ratio of rim diameter to rim length for each cooking vessel (n=21), boiling vessel (n=8) and utility vessel (n=18). A percentile comparison of these ratios, called the Rim Ratio, is shown in Figure 8.9.

Although only eight boiling vessels are represented, their rim ratios are larger (i.e., rim length per vessel diameter is smaller) than those vessels inferred for cooking and utility use, except for one case (a very small vessel). Rim ratios for cooking and utility vessels are practically identical, except in the case of very small vessels.

Rim Angle could be determined on 52 vessels, yielding a Target Mean of 84.45 degrees (90° being vertical). A percentile plot of Cooking (n=23), Boiling (n=10) and Utility (n=19) appears in Figure 8.10.

The graph of the data in Figure 8.10 demonstrates that cooking vessels consistently

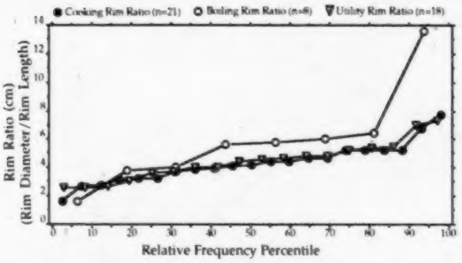


Figure 8.9. Inferred Vessel Use plotted against Rim Ratio (Diameter/Length).

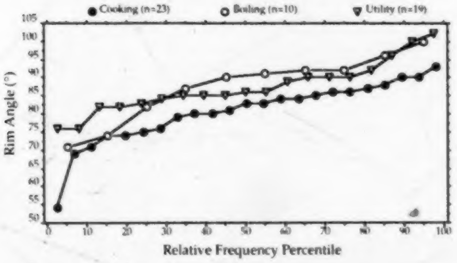


Figure 8.10. Inferred Vessel Use plotted against Rim Angle (° from horizontal).

angle outward to a greater degree (i.e. have a smaller rim angle) than either boiling vessels or utility vessels. T-tests assessing the rim angle means of each class suggested 1) cooking versus boiling vessel angles were not significantly different (t = -1.323, DF = 9, CVT=2.26 @ 0.05 sig. level), 2) boiling versus utility angles were not significantly different (t = 0.186, DF = 9 CVT = 2.26 @ 0.05 sig. level), but that cooking versus utility vessel angles were significantly different (t= -2.674, DF = 18, CVT = 2.10 @ 0.05 sig. level). The distinct nature of the inferred Cooking use vessel class is demonstrated in Figures 8.11 and 8.12, in which QQ Plot comparisons are made between Cooking and Boiling vessels and Cooking and Utility vessels.

Boiling and Utility vessel rim angles, on the other hand, are indistinguishable between classes, as suggested by Figure 8.13.

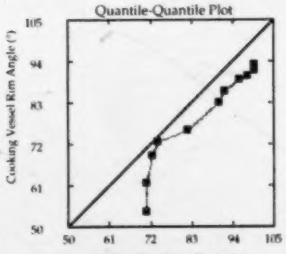


Figure 8.11. QQ Plot of Cooking vs. Boiling rim angles.

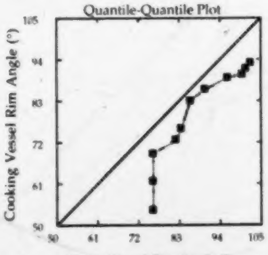


Figure 8.12. QQ Plot of Cooking vs. Utility rim angles.

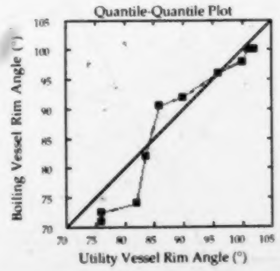


Figure 8.13. QQ Plot of Boiling vs. Utility rim angles.

Vessel Robustness - An average, or Mean Thickness of each vessel wall from lip to base was calculated by adding the five defined sherd thickness measurements (Tables 8.6 and 8.7) and dividing the sum by the number of represented measurements. Using this average, some indication of the solidity or 'Robustness' of a vessel could be obtained. Unfortunately, since the counts for each of these variables was dependent upon the degree of vessel reconstruction, considerable disparity in variable representation was present in this average. For example, vessels represented by rims alone yielded a Mean Thickness value based upon the mean of Lip Thickness and Below Lip Thickness variables. Fully reconstructed vessels produced mean thicknesses based upon an average of lip measurements, plus those of the neck, shoulder and wall as well.

It is not clearly understood what effect this disproportionate combination of measurements had in determining a vessel's Robustness measurement. Neck and shoulder measurements for some vessels were larger than the lip and below lip measurements, but equal or even less for others. The portion of the vessel below the shoulder was usually the thinnest part of a vessel, and may have decreased the overall Robustness figure for fully reconstructed vessels. However, only 19 wall thicknesses were obtained, and these may have been offset by the generally thicker shoulders which always were included with wall measurements. Consequently, Mean Thickness (or Vessel Robustness, as it will henceforth be referred to) required more caution in vessel characterization than with other vessel form criteria.

Vessel Robustness was calculated for 79 vessels, yielding a sample mean of 0.69 cm. This figure represented the combined thicknesses of rims, necks, shoulders and body portions, as they were represented on a particular vessel. As cautioned above, the validity of the resulting Robustness coefficient calculated for each vessel was questionable; nevertheless, in the absence of other data that could be used to assess how a vessel was constructed, it was used to produce Figure 8.14 . It shows the percentile distribution of Cooking (n=38), Boiling (n=14) and Utility (n=29) vessels plotted against Vessel Robustness.

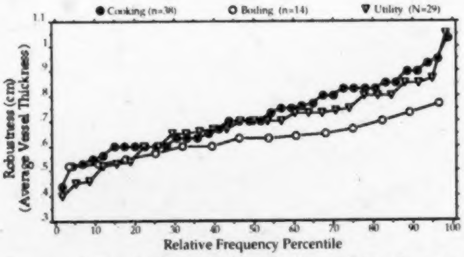


Figure 8.14. Inferred Vessel Use plotted against Vessel Robustness.

Referring to Figure 8.14, boiling vessels show the most distinctive distribution, in that they appear to be consistently thinner than both Cooking and Utility vessels. Cooking and Utility pots do not appear to vary significantly in thickness, even when directly compared using QQ Plots (Figure 8.15), but comparisons between these two vessel classes and the boiling class demonstrate the comparative thinness of the latter kind of vessel (Figure 8.16, 8.17). The disparity in robustness appears at approximately 0.55 cm and is consistently 0.10 to 0.25 cm less throughout the distribution.

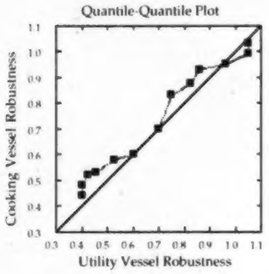


Figure 8.15. QQ Plot of Cooking vs. Utility Vessel diameters.

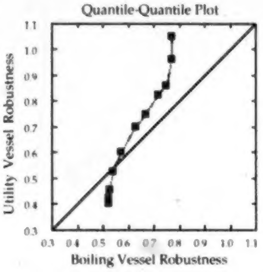


Figure 8.16. QQ Plot of Cooking vs. Boiling Vessel diameters.

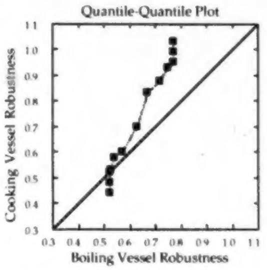


Figure 8.17. QQ Plot of Cooking vs. Boiling Vessel diameters.

Vessel Form Summary

Through analysis of various vessel metrics obtained from the Bushfield West ceramic sample several intriguing observations can be put forward regarding the characteristics of Cooking, Boiling and Utility vessels. These are summarized below in terms of vessel size, vessel form and vessel robustness. The significance of Vessel Form observations will be developed in a later section; at this point they will simply be stated:

Vessel Size Observations- Even though a sufficiently representative sample was not available to verify statistically the relationships between vessel use and rim diameter, the Rim Diameter data can be used to support several statements about Bushfield West vessel size:

1) There is no appreciable difference between cooking, boiling and utility pot orifice dimensions when vessel rim diameters are 10 cm or less.

2) cooking vessels exhibit larger rim diameters than boiling vessels when diameters exceed 10 cm.

3) utility vessels exhibit larger rim diameters than boiling vessels when diameters exceed 13 cm.

4) cooking and utility vessels cannot be distinguished reliably by rim diameter at any size.

Vessel Shape Observations- Certain shape characteristics can be associated with vessel use when rim angle and rim length are addressed. This observation has important implications for Selkirk archaeological sites. On these sites, rims are the most commonly recovered and individually identifiable vessel portions. Therefore, any observations, however tentative, about rim form and vessel use may be of significant import for developing models of ceramic use on other Selkirk pottery bearing sites. The following observations are based on rim length and rim angle studies from the Bushfield West ceramic sample:

1) Boiling pot rims are consistently shorter (by 1-2 cm) than cooking and utility pot rim lengths when rim length distributions are compared. Utility vessel rim lengths are marginally smaller than those of cooking vessels, which have proportionately the longest rims. Rim length/Rim diameter ratios appear to support these observations. However, these observations do not apply to vessels of very small size, especially when rim ratios are 2:1 or smaller.

2) Rim angle from the vertical (flare) is significantly greater for cooking pots, when compared to rim angles of boiling and utility pots. The average difference is approximately seven degrees. Boiling and utility rims may also flare outward, although at much smaller angles.

Vessel Robustness Observations- Robustness was based on the combined and averaged wall thicknesses of five landmarks (if available) on a particular vessel. The resulting statistic provided a crude estimation of overall vessel construction. The averaging was required so that vessels that were incompletely represented could be included as part of the statistic. The data from this statistic suggest the following:

1) Boiling pot vessel portions are generally thinner in profile than cooking and utility pots, for all sizes of vessels. The vessel portions of utility and cooking vessels are of equivalent thicknesses.

Figure 8.18 summarizes the general vessel form exhibited by the Bushfield West vessel sample. Generally speaking, cooking vessels are larger in size, have thicker walls, and have longer rims that curve outward at a greater angle than utility and boiling vessels. Boiling pots are smaller in size, have thinner walls and have short, nearly vertical rims. Utility vessels resemble cooking vessels in form, except that the rims are nearly vertical. The implications of these vessel form observations for developing vessel use hypotheses will be discussed shortly.

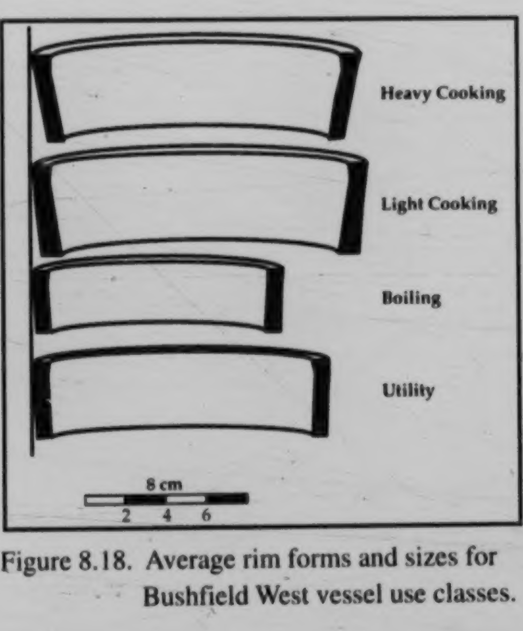


Figure 8.18. Average rim forms and sizes for Bushfield West vessel use classes.

Miscellaneous Attribute and Metric Comparisons

Miscellaneous Attribute Tests

Non-Significant Attributes - Chi-square tests of association between attributes such as Lip Decoration, Presence of Fabric, Fingerprint Presence, Vessel Recovery and Rim Shape versus Use Wear (vessel use) failed to demonstrate any statistically significant correlation (Tables 8.8- 8.12). When the Use Wear category was reduced to Heated vs. Unheated, the tests also failed (test results not shown).

	Cooking	**Boiling**	**Utility**	***Total***
Exterior	18	4	12	*34*
Elsewhere	11	5	11	*27*
Undecorated	9	5	6	*20*
Total	*38*	*14*	*29*	*81*

$X^2=2.19$ DF=4 CV=9.49 NH accepted

Table 8.8. Vessel Use versus Lip Decoration.

	Cooking	**Boiling**	**Utility**	***Total***
Fabric	37	14	26	77
None	1	0	3	4
Total	38	14	29	81

$X^2=2.96$ DF=2 CV=5.99 Test invalid

Table 8.9. Vessel Use versus Presence of Fabric.

	Cooking	**Boiling**	**Utility**	***Total***
Present	16	9	9	*34*
None	19	4	14	*37*
Total	*35*	*13*	*23*	*71*

$X^2=3.15$ DF=2 CV=5.99 NH accepted

Table 8.10. Vessel Use versus Fingerprint Presence.

	Cooking	**Boiling**	**Utility**	***Total***
Clustered	17	5	11	*33*
Isolated	21	9	18	*48*
Total	*38*	*14*	*29*	*81*

X^2=0.49 DF=2 CV=5.99 NH accepted

Table 8.11. Vessel Use versus Vessel Recovery.

	Cooking	**Boiling**	**Utility**	***Total***
Straight	23	9	20	*52*
Other	12	5	7	*24*
Total	*35*	*14*	*27*	*76*

X^2=0.63 DF=2 CV=5.99 NH accepted

Table 8.12. Vessel Use versus Rim Shape.

Fingerprints and Paste Quality - In the previous chapter, an hypothesis regarding the presence of fingerprints on some vessels and their absence on others was formulated. The hypothesis stated that the presence of prints was a function of paste quality. The alternative hypothesis was that other factors were responsible. Reformulated for testing using chi-square, a null hypothesis that stated that there was no relationship between the presence of fingerprints and the quality of paste was rejected (Table 8.13).

	Present	**Absent**	***Total***
Good	22	11	*33*
Moderate	10	21	*31*
Poor	4	10	*14*
Total	*36*	*42*	*78*

X^2=9.92 DF=2 CV=5.99 NH Rejected

Table 8.13 Presence of Fingerprints versus Paste Quality.

Although there was a relationship between paste colour and paste condition, there appeared to be no significant relationship between paste colour and the presence of fingerprints (Table 8.14).

	Present	Absent	*Total*
Light	14	12	*26*
Dark	22	30	*52*
Total	*36*	*42*	*78*

$X^2=0.93$ DF=1 CV=3.84 NH Accepted

Table 8.14. Presence of Fingerprints versus Paste Colour.

Fingerprint Hypotheses - Regarding the presence of fingerprints on vessels at Bushfield West:

1) Fingerprints are found as often on light coloured pots as dark coloured pots. In other words, it does not appear to be the case that lighter or darker vessels were purposefully selected for fingerprint decoration.
2) Fingerprints are more likely to be found on vessels with good quality paste than on vessels of poor quality paste. Consequently, dense paste was more amenable to imprinting of fingerprint traces. Rather than purposeful selection, it is hypothesized that fingerprint "decoration" was really a serendipitous function of the amenability of a vessel's paste to sustain very fine imprints through the moulding, drying and firing process.

Miscellaneous Metric Tests

Considerable metric data were gathered about punctate morphology, since punctates were nearly ubiquitous to the Bushfield West collection. Detailed analyses were made between punctate spacing, punctate distance below lip, punctate spacing/distance below lip ratios and vessel use. No statistically or even graphically suggestive differences were found in comparing these kinds of measurements to vessel use categories. Vessel decoration did not appear to be a function of vessel use.

VESSEL DIFFERENCES AS A FUNCTION OF VESSEL USE

In the above analysis I have attempted to show that the way a pottery vessel was used on Bushfield West helps to explain why there is considerable variation in shape, construction and size within the site vessel collection. In the following section, several hypotheses regarding why vessel form and composition are modulated by function are tendered, based on observations about vessel size, shape and robustness.

Paste characteristics and vessel function

For Bushfield West vessels, summary observations on paste condition indicated that this characteristic could be correlated strongly with the amount of heating a vessel underwent during its use. In fact, observation from sample data indicate that it is unlikely that vessels made of poorly consolidated paste could have been used on a fire at all without fracturing. In the absence of local ethnographic information on ceramic use, is it possible that Bushfield West potters intentionally made vessels of varying quality with the intention of using them for different purposes? Alternatively, if quality control were less precise, could it be hypothesized that vessels which by chance exhibited good paste characteristics would have been purposefully reserved for cooking use, and those with poor paste been relegated to minor or non-heating tasks?

Regarding the former hypothesis, it seems implausible that a potter would intentionally make a poor quality pot, given the amount of work required to prepare paste, work the vessel into shape, apply decoration, dry it and then harden the results on a fire. Since firing failures were always of concern, the best strategy would be to try and make every vessel as solid as possible to maximize firing success. One cannot discount the possibility of poorer quality pots being the product of less proficient potters, particularly those just learning the skills of pottery manufacturing. Finally, the success of the drying process can also have a significant bearing on the outcome of pot firing, as suggested by Hanna (1983). If the clay of freshly-constructed pots could not be completely dried because of certain uncontrollable factors (especially the weather), even successful firing may have produced a batch of pots suitable only for storage purposes.

In any case, the latter hypothesis would suggest a scenario whereby at the time that vessels were removed from the tempering fire, the survivors were culled and marked for particular functions according to their functional suitability. Good quality pots were chosen for cooking, pots exhibiting poorer paste were used for boiling and the poorest quality vessels were used for less stressful functions such as wet and dry storage.

Unfortunately, data from Bushfield West do not lend much support to either hypothesis. Some vessel data suggest that paste condition may have been a function of the use to which a vessel was subjected, rather than serving as the criteria for defining its function. Such an idea has some support in the ethnographic record, in which Wissler (1910:26) discusses comments by an informant indicating that the more a clay pot is used on a fire, the harder its paste will become. Following this line of reasoning, dense paste exhibited on many Bushfield West cooking vessels may once have been less well-consolidated clay material, which naturally hardened through use on a cooking fire. At the present level of understanding, it cannot really be determined which hypothesis applies to the Bushfield West situation. However, it appears that replication studies would greatly assist in sorting out this problem.

The relationship of paste colour to vessel function is also unclear, and can be attributed to many causes. Rye (1981:109) indicates that black coloured pastes may be produced by immediately cooling freshly fired vessels in a reducing atmosphere, thereby removing oxygen. On an open fire, this reduction can be done by smothering the embers with dung or damp moss. This procedure may account for the colour of the few completely black vessels found on Bushfield West. It is also possible that paste darkness may have been enhanced by the application of various substances on a pot prior to its firing.

This phenomenon was observed by Simon (1979:22) during experimental replication studies, in which she noted that pots greased prior to firing tended to produce black paste cores even when oxidation firing was carried out. Finally, it may be assumed that if pots are continually used in cooking, the repeatedly heated contents will contribute to paste darkening.

Within the Bushfield West vessel assemblage, it can be hypothesized that the shade of vessel paste was probably a function of the degree of firing, and the amount of cooking contents that were slopped on the outside and permitted to burn off. Thus, it is logical that heavy cooking pots would bear the darkest pastes, while lighter cooking pots and boiling vessels being less heavily stained, would consist of lighter pastes.

Vessel Form

The most visible differences in vessel form appeared between boiling pots and cooking pots. The actual distinction between "boiling" and "cooking" pot functions, defined but not addressed specifically in the previous chapter, is actually related to the degree of cooking residue that forms on vessel sherds. As will be elaborated upon below, this feature is believed to be a function of vessel contents.

Boiling pots were shown to be generally smaller, and had thinner walls than cooking pots. They also displayed a short, near-vertical rim profile in contrast to the longer, more angular cooking vessel rims. Accounting for this form discrepancy necessitates a consideration of how such vessels were used to cook food or boil liquids. For the northern regions of North America, where there are no reliable data available documenting the use of pottery on hunter/gatherer sites, vessel use is almost entirely conjectural. Apart from general observations concerning people using pots (e.g., Ericson et al. 1971; Stanislawski 1978; Wilson 1977), there are scarcely any data on how pots were used to cook food. The conventional wisdom is that pots were filled with cooking or boiling contents, then simply placed on a few strategically arranged rocks, or in a shallow hole within an open fire (Wilson 1977:104). Eventually contents became hot and were used.

More considered analysis suggests that cooking food in relatively fragile ceramic vessels was probably a much more complicated process. Experience by the author has shown that placing a liquid-filled, round-bottomed ceramic pot against suitably positioned rocks is no easy task, and it is greatly complicated when the vessel sits in the middle of a blazing or even smouldering fire. Even small vessels are not easy to handle, being prone to overbalancing as firewood is consumed, support rocks shift and shallow holes fill with ash. Dealing with an already-heated small pot is even more difficult. Since small vessels usually have orifices too small to permit contents to be ladled out while they remained in the fire, they were probably completely removed for content access. They could be directly picked out of a low fire if hands were protected by thick hide, but larger, hotter fires would require that some kind of grabbing tool be used, like tongs (made from folded willow branches). Tongs are most effective when used on pots with flaring rims, which permit the pots to be grappled from the top.

Certainly, large vessels containing liquid would be very difficult to place within an existing blaze; a fire would have to be kindled around them. Furthermore, when large vessels are heated in this way, they would be prone to serious damage. As the fire builds up, supporting objects such as rocks are more slowly heated than a vessel's paste. Resting against them, a pot's walls are subjected to significant thermal stress, and may crack. As the fire cools, the same process would be repeated in reverse.

Consequently, the most difficult aspect of cooking with larger vessels is the problem encountered in trying to find a place in a fire where heat is constant and relatively intense. Large vessels containing a large amount of liquid require considerable heat to be brought to a boil, or even a constant simmer. Unevenly applied heat can potentially create untenable thermal stress over a large area of the pot. Experience by the author has shown that applying low, constant heat (difficult to achieve on an open fire) on larger vessels insufficiently heats pot contents to boiling temperature.

Thermal stress is most evenly distributed on the broad, rounded base of a vessel (Braun 1983). The consistently hottest part of a fire is not in the coals, or around the combustible material, but above the area of combustion, where the heat is concentrated near the tip of the flames. If a round-bottomed vessel were suspended in that area, the heat would be intense, yet broadly applied over the bottom portion of the pot so that thermal stress would be minimized (Figure 8.19).

Since large pots are particularly unwieldy, even when full of cold contents, its seems unlikely that these vessels were handled in any manner when hot. Contents were probably removed by ladling, rather than by physically removing the pot. Again, suspension of large pots would have facilitated ladling of heated contents, since the vessel orifice would be located well above the fire and shielded from the direct flames.

Figure 8.19. Example of a suspended cooking pot. Photo courtesy Manitoba Museum of Man and Nature.

Suspension of cooking vessels over a fire has received only limited ethnographic documentation on the northern plains. For example, Wissler (1910:26) describes informants stating that vessels were hung over a fire during use, suspended by rawhide cords wrapped around their rims. This picture is contradicted by a Mandan informant who told Gilbert Wilson in 1906 that pottery vessels were placed in the fire and not suspended (Wilson 1977:104). This conflicting testimony must be placed in the context of clay pot usage into the late 19th century, however. At this time suspendable metal vessels were widely available and were supplanting ceramic pots for cooking meat, as observed by Alexander Henry (Coues 1897, I:328, as quoted in Wilson

1977:104). Before the widespread use of metal pots, clay vessels may have been more widely used for domestic tasks. In fact, while visiting the Mandan in the 1830s, Catlin was amazed to note that hand-made clay pots were hung over a fire like iron pots, and used for cooking (Catlin 1973:116).

If some of the Bushfield West vessels were suspended over fires for heating purposes, the method of support is not immediately obvious. None of the vessels from Bushfield West bore handles or strategic holes where suspension cords could have been attached. The most obvious means of suspension would have been to tie a cord around the rim and then tie suspension lines to the rim cord. This was a not-uncommon means of supporting pots when they were used for water carrying (Wilson 1977:105; Wissler 1910:26). The cord would probably slip off vessels with vertical or incurvate rims, but could be securely placed around a rim with a significant outward flare. Larger vessels with long, angled rims would have been likely candidates to suspend over a fire, rather than being set directly within the flames.

It has been shown that cooking vessels from Bushfield West were larger and more robust than boiling vessels, and exhibited long, angled rims. Using this evidence, and taking into account the difficulties encountered in heating large vessels directly within a hearth, I strongly suspect that they were constructed in that way so as to be hung over flames instead of being placed directly in a fire. Suspended, a cooking pot could be raised and lowered as fire intensity fluctuated, and would be directly accessible when contents were to be replenished or removed. A suspended vessel could also be heated for long periods of time, and would be highly amenable to stewing meat or boiling the marrow out of smashed bone. As the vessel was put out of the way, its fire could be repeatedly tended without fear of the pot being damaged. Smaller cooking vessels may have been suspended as well, but their more flaring rims probably served as grappling points for wooden tongs.

Unlike cooking pots, boiling vessels were probably designed to boil liquids such as water rapidly for the preparation of beverages, or medicinal or ceremonial concoctions. Therefore, they would have been more useful if they were smaller in size, a feature which would make them easier to handle. Having thinner walls, which would conduct heat much faster than thicker walls, these smaller, more efficient heating vessels could most likely be set right on a smaller fire and could be used to bring smaller amounts of water to a boil rapidly. Not normally suspended like cooking pots, or requiring handling by tongs, boiling pot rims would not have to be long or flared. Direct hearth placement may have been the way that most of the boiling vessels were used on Bushfield West.

Utility vessels would not have required the design features of either cooking or boiling pots. Since the pots were never meant for cooking, rims would not have been required to be flared, nor would the walls have had to be made especially thin. It is possible that they were robustly constructed in the manner of cooking vessels, since they were probably directly handled more frequently. It is also possible that many poorly fired cooking and boiling vessels were relegated to utility vessel tasks if it was felt they would not stand up to constant heating over a fire. Cooking vessels which showed evidence of premature failure may have been treated in the same way. This feature may explain why there appears to be significant variability in vessel form for utility vessels.

Specialization of Cooking Vessels

It will be recalled that cooking vessels were originally classified into two categories: light cooking and heavy cooking (see previous chapter). Although heavy cooking vessels (n=27) were the most common of these kind of pots, remains of 11 light cooking vessels were identified. It may be postulated that light cooking pots represent vessels which were not used as much as heavy cooking pots, possibly because they were broken before dense cooking residue had accumulated significantly during use. An alternative postulate is that the two kinds of vessels were actually used for different cooking purposes.

It has been hypothesized (in Chapter 5) that bone smashing and subsequent grease rendering were practiced at several activity complexes on Bushfield West. The primary evidence for this activity was the presence of finely smashed bone associated with fire-broken rock, hammerstones and anvils, all in proximity to large, well-used hearths (Dyck 1977; Gibson 1989; Vehik 1977:170-171). The basic process involves immersing the bone fragments in boiling water so that the grease is released and collected (an ethnographic synopsis is provided in Dyck 1977: 263-264). Although a number of ways have been observed ethnographically concerning the procedures used to render bone into bone grease, the use of pots as rendering vessels has been specifically mentioned (Vehik 1977:171). For pot rendering, bone elements were broken to a point at which the fragments were small enough to fit into a container of simmering liquid. As the fatty marrow was released from the bone pieces, it rose to the surface of the simmering liquid and was skimmed off (Vehik 1977:171). The marrow could be stored in either solid or liquid form. Among the Plains Cree, these renderings were called *oskanpimi*, meaning "bone grease" (Mandelbaum 1979: 58).

Johnson (1983) has suggested that ceramic vessels were used to extract bone grease at the Mondrian Tree site in North Dakota. He indicates that vessels used for grease extraction would require orifices of sufficient size to permit rendered fat to be skimmed from the boiling water surface. Temperatures would not have had to have been excessive; simmering water was better than boiling water, permitting grease to be skimmed easily (ibid:1983:9.49).

A Replication Experiment

The ethnohistoric support aside, when the Bushfield West pottery vessels were examined it was not known whether animal fat was the agent responsible for the formation of residue on the pots, although it was strongly suspected. It was not clear exactly why hot animal fat would form such a residue, nor was there any information available about how much fat was necessary to cause cooking residues to accumulate to the levels observed on a number of the Bushfield West vessels. In an effort to gain some insight into this process, several simple replication experiments were devised to determine what materials, (vegetable matter, fruit and animal fat) form residues on clay vessels, and if so, how quickly the residues will form, and what they will look like.

The experiments involved heating lard rendered from cooked bacon and sausages, and freshly-picked saskatoon berries in clay pots. The vessels that were used for the experiment had been hand-made and fire-hardened over an open fire several years previously, and were made available to the author by the Saskatchewan Archaeological Society. During the cooking experiment, both the grease and the berries were cooked in separate pots of boiling water over an open camp fire for 30 minutes. After each cooking period the pots were removed from the fire and allowed to cool down slowly. Once cooled, the grease and boiled berries were dumped out and the rims of the vessels examined and photographed. The pots were then re-filled with water and brought to a boil again and each was topped up with more grease or berries. This process was carried out four times.

The replication experiments appeared to verify the hypotheses established above regarding the processes responsible for forming various kinds of residues on clay pots. After the first cooking period, the vessel used to cook grease exhibited a thin uneven black residue which had formed on the upper portion of the interior rim. After each use, the residue thickened and spread over the rim. The residue formed most clearly when the dissolved fat floating on the surface of the boiling water was splashed on the rim of the vessel by escaping steam bubbles. The fat globules vapourized upon contact with the pot's very hot rim. The remnant material was a hard, black residue resembling the encrustation found on many of the Bushfield West pots. After the fourth time cooking grease, the vessel, still very hot, was removed from the fire and the fat poured out. In the area in which the fat was poured, a large patch of residue was formed where the substance was burned onto the clay surface.

The pot used to boil berries did not bear any carbon encrustation, even after the fourth firing. Instead, the upper portion of the vessel interior was stained a grey-black colour. This staining progressively darkened with each boiling.

The above study was designed to determine if characteristic residue patterns form on vessels when they are used to heat certain materials believed to have been used on prehistoric sites. As an experimental replication study, it was considered a preliminary examination of the nature of residue formation on pots, pointing the way to a more extensive series of experiments in which verifiable conclusions could be made. In fact, a number of subsequent pottery cooking episodes were performed over several years in a number of public archaeology venues, yielding essentially the same results, namely that heavy black residues are formed on pots which are used to cook fat, and that less thick stains are caused by cooking non-fat-containing substances such as berries or vegetables.

Summary

It is probable that the heavy cooking pots from Bushfield West were used for marrow grease extraction activities. It has been suggested (and supported to a limited extent by replication experiments) that the residue deposits found on Bushfield West cooking vessels were the product of long-term cooking of liquid contents which slopped onto the rim and neck area, eventually being carbonized permanently onto the paste. The presence of thickly encrusted residue seems to indicate that the liquid which was evaporated on the paste was itself thick in consistency, possibly being largely composed of fat or grease. This kind of encrustation process would occur if bone fragments were broken and simmered in a pot, causing their fat-laden marrow to be released into the hot water. The released fat would float on the water surface at the rim level, where it would ordinarily be skimmed off. However, if boiling became vigourous, the fat would be splashed haphazardly on a rendering pot's rim, where, the vessel being hot, it would burn onto the vessel.

Pots exhibiting less residue encrustation (defined as light cooking pots), may not have been used for marrow rendering. The thinner residue may still have been formed from the carbonization of fat suspended in liquid, but it is hypothesized that the relative amounts of fat were small, possibly being rendered from boiling meat. Therefore, it is suggested that light cooking pots may have been used for making stew or soup. Following this line of reasoning, pots exhibiting trace residues were probably not used for cooking meat. They are hypothesized to have been used for preparing non-fatty hot beverages equivalent to historic and contemporary tea, or medicinal potions, and were reserved as water boiling kettles.

To summarize the above, it is hypothesized that heavy cooking pots were used extensively for bone marrow extraction, and would be associated with activity areas in which intensive bone breaking took place. Lighter cooking pots, which were probably not used for grease extraction, would be found in areas where mixed domestic activities took place. Water boiling pot remains should be found with less frequency in domestic areas, but may be more commonly recovered in areas of special activity, such as tents in which male-oriented activities take place, or in which male and female ceremonial behaviour dominates. These hypotheses will be tested when actual activity complexes on Bushfield West are examined in terms of vessel function.

SUBJECTIVE VERSUS OBJECTIVE ANALYTICAL CRITERIA

The objective criteria defined in the above work were critical in characterizing certain aspects of the Bushfield West ceramic collection. For some pots, however, certain ceramic characteristics could not be adequately addressed by the objective criteria because they were difficult to categorize or measure. Intuitive reflection nevertheless suggested that they were clearly important factors that served to differentiate some vessels from others. These circumstances required the definition of a subjective vessel classification using categories that did not correspond to the objectively organized criteria laid out in the previous chapter. In this somewhat "ad hoc" system, some vessels were perceived to be of similar form. For other pots, decoration proved to be a significant correlating factor. Occasionally a combination of many factors that defied adequate objective definition were used as associative criteria in characterizing vessels. This is not an uncommon approach. Selkirk ceramics have few decorative criteria, and yet in the past have been accurately characterized using general descriptive terms of vessel definition based upon paste, exterior fabric texture, lip decoration and form. Subjective categorization processes have been one of the primary ways in which Selkirk ceramics have been separated into wares and complexes.

Efforts by the author to define descriptive criteria explicitly for the Bushfield West ceramic collection were not entirely successful. Depending upon the complexity of the criteria, either all pots coded the same, or each pot became a class unto itself. In the conversion from physical pots to categorically defined models, a critical quantity (and quality) of data were lost, and the relationships between the various attributes were significantly weakened. During the coding process, critical ceramic variables were found to be too subtle to record consistently or to be interpreted objectively to form a model. On the other hand, a reasonably experienced ceramics analyst could have immediately perceived variability within the ceramic assemblage using visual and tactile senses. Furthermore, the same analyst would have been able to categorize all of this information almost instantly, producing what is generally called a "subjective" interpretation. Despite the derogatory connotations usually associated with subjective analytical interpretations, at the current methodological stage of ceramic (and probably general artifact) analysis the subjective analytical approach is often more useful in producing much archaeological explanation than any number of objective multivariate statistical studies.

Consequently, in the following chapters I will attempt to supplement the already-defined descriptive criteria with some subjective interpretation, particularly in lumping ceramics into classes based on "look and feel". It is argued that this is a valid approach, since it adds an extra dimension to the ceramic analysis, and in some ways can contribute to the formulation of more working hypotheses which can be tested with the objectively derived criteria.

GENERAL POTSHERD FORMATION PROCESSES WITHIN AND BEYOND RESIDENCES

During the analysis of the Bushfield West ceramic assemblage, it was rare to find more than about 50-75% of a particular pot that could be reconstructed. Although there was a great mass of body sherds that could not be cross-mended with any particular vessel, all rims, and most necks and shoulders, were matched with one another, or were identified as representing unique vessels. What became of the rest of any single vessel is difficult to determine, since a large area around each activity complex was completely excavated. It is possible that debris within each structure was periodically collected during occupation and the discard dumped beyond the excavated area, although why only parts of vessels would be swept up is difficult to determine. It is also possible that pieces of broken ceramics (particularly rim sections) were curated for some reason, possibly for throwing at camp dogs. Certain discard patterns may account for the incompleteness of the vessel assemblage, as will be discussed.

Drop-Toss and Cluster Discard artifact formation models (Chapter 6) help to explain the patterning of lithic and bone debris within an activity complex on Bushfield West. However, it is clear that these models cannot fully describe the depositional patterning engendered by pottery use. The presence of pottery implies its use for storage, processing and transfer (Rice 1987:209), and for cooking. Unlike tool making, food consumption or preparation, pottery use does not produce significant ceramic wastage unless vessels are broken or discarded. Though it is true that pots can serve useful purposes even after they are broken into pieces (Skibo 1992:44), for the most part once they have come apart the resulting pottery sections and sherds are waste and are consigned as discard.

Trying to second-guess the life history of the average ceramic pot used on Bushfield West is perhaps a presumptuous exercise given the paucity of data about Cree use of pottery. However, it is apparent from the archaeological remains that a number of vessels were broken within tents, and most of these breaks occurred during use. Since this study focuses on ceramic function, some comments will be made regarding how cooking, boiling and utility pots may have been discarded on the site.

Cooking and Boiling Pot Disposal

For cooking pots, breakage probably took place while the vessel was on (or suspended over) a fire. Replicative liquid-containing pot cooking experiments by the author seem to suggest that cooking pot breakage is not usually catastrophic. A failed pot does not simply disintegrate into pieces all at once; instead, a crack may develop so that contents start to leak, or part of the exterior may spall away into the fire. Contents are usually rescued before they are lost, and the damaged vessel retrieved in a somewhat whole, if less usable, condition. However, should the damaged pot be placed back onto the fire and used as a kind of makeshift heating or frying vessel, pieces around the edge of the fracture actually start to break off, and eventually what is left must be discarded.

Taking into account this experimental evidence, it should not be unusual to find a few pieces of cooking or boiling pottery in an excavated fire hearth, although sherd frequencies would probably be quite low. These pieces would be the result of uncontrolled vessel failure. Thus, Type 2 cluster discard, in which pottery sherds are purposefully tossed into a hearth (see Chapter 6), is probably largely inapplicable to cooking pottery use. Any sherds falling into the fire were probably the result of use (i.e., Drop Disposal) rather than discard. A rescued pot may have been sufficiently intact for re-use as a container, or as a dry-cooking vessel. However, if, after cool-down, it was found to be unusable it was probably expediently tossed, more or less whole, into an existing discard area (Toss Disposal). Sherds and sections, on the other hand, would also be tossed into discard areas, though individually, since only rarely would the original pot have broken on a specially laid out collection mat or skin, unless it was dropped or purposefully smashed.

Consequently, the Type 1 cluster discard model (in which debris is allowed to accumulate on mats for disposal) cannot be applied to cooking or boiling pottery very easily. In fact, vessel cross-mends in all ceramic-bearing sub-blocks of Bushfield West show that most vessel pieces were strewn over an area exceeding that expected for Type 1 cluster discard. Instead, distributions of cooking and boiling vessel fragments in a number of tent areas appear to reflect toss discard.

Type 3 cluster discard, in which debris is purposefully collected and removed a great distance from its source of production, was defined as the result of ceramic discoveries on the site. The discard pattern seems to reflect the dispersed nature of boiling and cooking vessel disposal, whereby only parts of a pot are collected as trash for removal from a residence. Interestingly, Type 3 cluster discard may be an important reason why few vessels could be reconstructed in their entirety. Vessel sections may have been cleaned out of a residence area and dumped well beyond its boundaries, perhaps in an area not excavated.

Pot Smashes

In several places on Bushfield West entire smashed pots were found *in situ*, some within tent areas and at least one away from any recognizable activity cluster. These pot smashes did not seem to be associated with any other cluster discard artifacts, and represented anomalous piles of sherds in an otherwise relatively debris-free area. It appears that these vessel remains were cluster discards (Type 1 and Type 3) of relatively intact vessels, since they could be almost entirely reconstructed after excavation. However, even the cluster discard models cannot explain the anomalously complete nature of these reconstructed pots.

Constant heating and re-heating over a fire would presumably take its toll on a well-used cooking vessel. It is likely that thermal stress would eventually cause the bottom of the vessel to crack, forming a leak or small hole. Although relatively intact, the pot would probably have been regarded as having come to the end of its useful life. It would probably be very sooty, and heavily encrusted with cooking residue. Although its paste would have been hardened by constant heating, the overall vessel structure may have been quite brittle, with numerous cracks resulting from constant thermal stress. As such, it was probably not in any re-usable condition. Thus, a retired cooking pot was probably discarded whole into a debris dumping area, or even abandoned in a residence when camp was moved.

Following this conjectural hypothesis, large cooking pots would be expected to make up the bulk of the pot smash ceramic scatters on Bushfield West. In fact, this is the case. Of the four pot smashes found on the site, three were of cooking pots. The fourth vessel was determined to be a manufacturing failure that was never used.

Utility Pot Disposal

Since utility pots were presumably not used on a fire, any sherds that were found in a hearth were probably the result of Type 2 cluster discard. Furthermore, if a utility pot broke, it was probably as the result of direct handling, since cooking and boiling pots would spend more time over a fire, out of direct reach. When it broke, it was probably more catastrophic, so more sherd pieces would be found in the break area. The breakage would probably result in more Type 1 cluster discard, since sherds and sections would have more of a chance to be collected on mats.

Drop disposal should be minimal, unless a mishandled pot was left broken in place. However, drop disposal of *contents* is another matter. Dry contents may have been recoverable; wet contents were probably lost. Normally, consideration of contents is a moot point from the standpoint of archaeology, since contents would not be expected to survive in the archaeological record. However, it is contended that evidence of some contents did survive on Bushfield West, in the form of ochre pigment, as will be explained in the next chapter.

Chapter 9

INTERPRETED BEHAVIOUR AND CERAMIC USE ON BUSHFIELD WEST'S LIVING FLOORS

INTRODUCTION

Chapter 5 provided a summary of the features and artifacts found on Bushfield West's occupation, while Chapter 6 established methods of interpreting the remains in terms of human behaviours that created the debris and feature distributions. Particular emphasis was placed upon trying to develop a means of distinguishing characteristic use of space on the site by gender. It seemed inappropriate to interpret spatial divisions for other kinds of social groupings (such as rank, clan membership or some unspecified sodality) for what is believed to have been an essentially egalitarian society producing material remains largely bereft of any correlates serving as hypothetical group insignias. On the other hand, ethnographic evidence, the well-preserved context of the Bushfield West archaeological deposit, and the means used for its recovery and analysis suggested that intra-site (as opposed to intra residence) gender-use differentiation of living floor space could be undertaken. One aspect of this chapter attempts this study.

In Chapters 7 and 8, the ceramic remains found on the site were characterized and a body of theory developed to explain pottery variation within the assemblage. Most vessels exhibited remarkable stylistic homogeneity, making it difficult to differentiate vessels into distinct stylistic classes. A few stylistic attributes were found to be statistically significant, however, and they were explored in some detail. Pottery function hypotheses did permit vessels to be classified by use, and pot function was hypothesized to be an important means of deducing the kinds of activities that took place in areas in which pottery was found on the site.

As a consequence this chapter attempts to compare the hypothetical activities taking place in some areas of Bushfield West, deduced independently through vessel use interpretation and gender use modeling. It also seeks to determine if there are other pottery indicators besides function (such as certain stylistic attributes) which can help to deduce certain behaviours on the site, or can be used to indicate the gender of the user.

Identifying Sheltered Occupation Areas

The interpretation of indoor versus outdoor activities on Bushfield West proved to be a difficult problem at the outset. No physical evidence of structures was ever found during excavation of the site; despite over 600 square m of occupation surface being exposed by trowel, and the majority of the surface being swept clean by hand brush for photomapping, no evidence of any structure impression, or even a post hole was ever encountered. Since the paleosol in the densest parts of the excavated area was wholly collected for water screening, it is argued that even a few post hole remnants would have been observed during excavation, since the visual contrast between the thin black occupation zone and the underlying sand was often striking. Lack of post holes seems incongruous for such a complex site in which many activities have been demonstrated to have taken place. Even if trees were available for sheltering structures from the wind, and possibly serving as anchor posts for tying them down, it would be expected that drying racks would have to be erected around the fires, and that they would have left discernible impressions in the relatively soft sandy earth in the camping area.

In fact, there was little evidence of purposefully ground excavation anywhere on the site. Most discard middens were simply surface scatters of debris, although discard debris was found in several natural ground depressions which appeared occasionally in some areas of the site. Only four purposefully excavated pits were discovered during excavation. One, full of fire broken rock, was recorded at the edge of the riverbank, eroding into the river. Another fire broken rock pit was found a few metres away in the south portion of Block 1. A third fire broken rock pit was found in Sub-Block 2.2 and a fourth was found three m to the northeast of the latter feature. Of the several dozen hearths observed on the site, not one appeared to have been purposefully constructed within even a shallow pit, although many showed considerable evidence of long-term and intensive use.

Lack of subsurface excavation in predominantly soft soil, in spite of the presence of several anomalous rock pits, suggests that there may have been a significant impediment to purposeful ground penetration. Taking into account the various seasonality data which indicate a mid to late spring occupation of the site, it is entirely possible that the ground was at least partially frozen at the time that Bushfield West was occupied . Partially frozen forest soils would have discouraged post pounding, and may explain why erected structures would not have left any impression on the ground where they stood. Only a few heat-related rock pits were actually dug into the ground, presumably where the soil had been thawed sufficiently for their excavation.

If the soils were not completely thawed, it is suspected that the climate was probably somewhat cool, characteristic of a late-arriving spring. This would suggest that most activities requiring any kind of intensive hand work would be conducted within shelters, at least when the weather was particularly cold. As a consequence, it is hypothesized that almost all activity complexes identified on the excavated portions of Bushfield West were contained within some kind of hide dwelling. In the absence of any conclusive physical evidence, positions of structure outlines for all activity areas were inferred from the best available evidence, as were the locations of dwelling entrances and exits.

Ceramic Variability within Men's Activity Areas

Referring to Chapter 6, in which criteria were identified which could be used to hypothesize relatively specific behaviours responsible for archaeological remains, several archaeological indicators were mentioned that could be associated with certain types of ceremonial behaviour. On Bushfield West, these ceremonial indicators were clearly observed in several different areas in conjunction with remains resulting from activities deduced to have been conducted primarily by males. Although these were interesting discoveries, they were not particularly unusual. What was intriguing about the behaviours was that considerable numbers of pottery vessels were found associated with them.

The presence of pottery is normally associated with female behaviours related to vessel manufacture, cooking and storage. It has been assumed that men would not have much use for pots since fragile clay vessels were not particularly suited to non-sedentary lifestyles associated with hunting. Even if men were in a sedentary situation, such as a long-term encampment, they would be in residence with their families, in which women would be responsible for carrying out day-to-day domestic activities in which pottery would be used. Unless these assumptions are in error (and it is acknowledged that there will always be exceptions), it could be assumed that men's use of pottery might be different than the uses made by women. It is also possible that men, in their selective utilization of pottery, might prefer to use a specific kind of pot. The situation at Bushfield West provided an opportunity to investigate these possibilities.

Two separate areas of the site exhibited evidence of extensive tool making and ochre processing (identified as strong indicators of male behaviour), and also yielded the remains of reconstructible pots. One was found within Block 2 and another within the remotely situated Block 3.

Sub-Block 2.3

As explained in detail in Chapter 5, this area, located in the northeast portion of Block 2 (Chapter 5, Figure 5.3), bounded two major artifact scatters and three hearths (Figure 5.14). Tool recoveries were significant, and six pottery vessels were identified and associated with the area (Table 5.8). Eight separate activity areas were defined, comprising at least three activity loci, all focused around the hearths.

Activity Complex Interpretation

Around the central (and largest) hearth was a major lithic workshop, with cooking and ochre-making also carried out. A piece of highly exotic iron was recovered beside this hearth (Figure 9.1). The hearth area to the northeast harboured a smaller workshop where stone and bone tools and paint were manufactured. Certain activities such as ochre painting and smoking were also indicated (Figure 9.2). The southeast hearth was apparently used by individuals for hide working, clothing manufacturing and meat (and perhaps egg) roasting. All three areas shared ceramic crossmends, used many of the same discard areas, and were located within an area of approximately two metres radius. Thus, it seems probable that the three areas were integrated within a single relatively large covered dwelling interpreted to be approximately 5 m in diameter, which would account for the clustering of the debris scatter.

Since two major discard areas were situated north and south of the hearths, it is difficult to interpret whether these may have been where entrances to the structure were

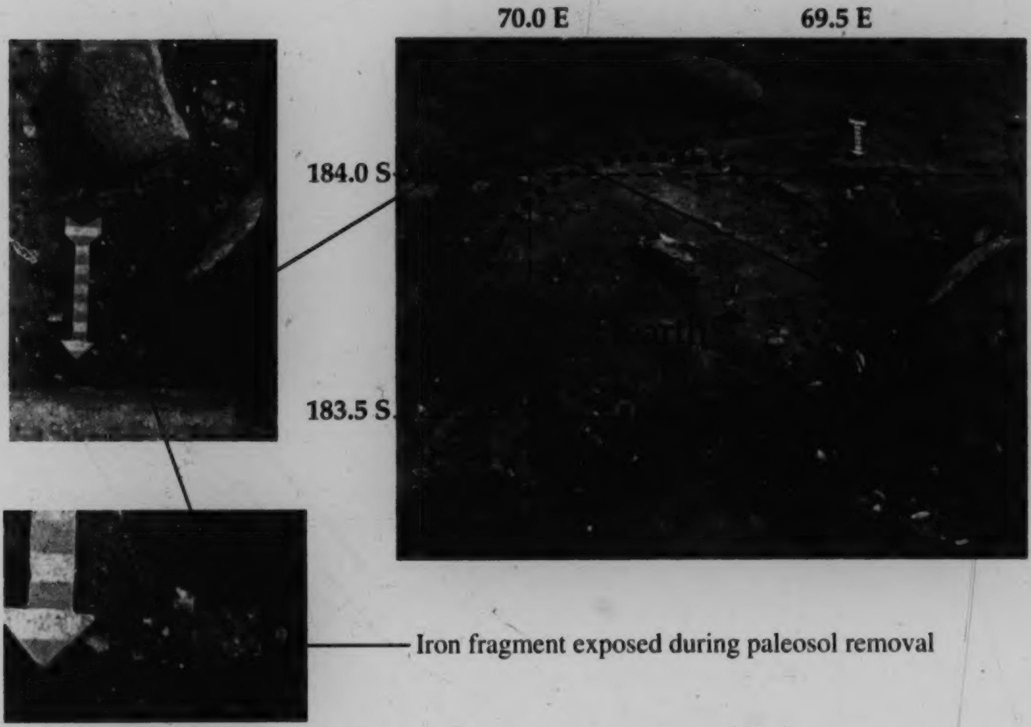
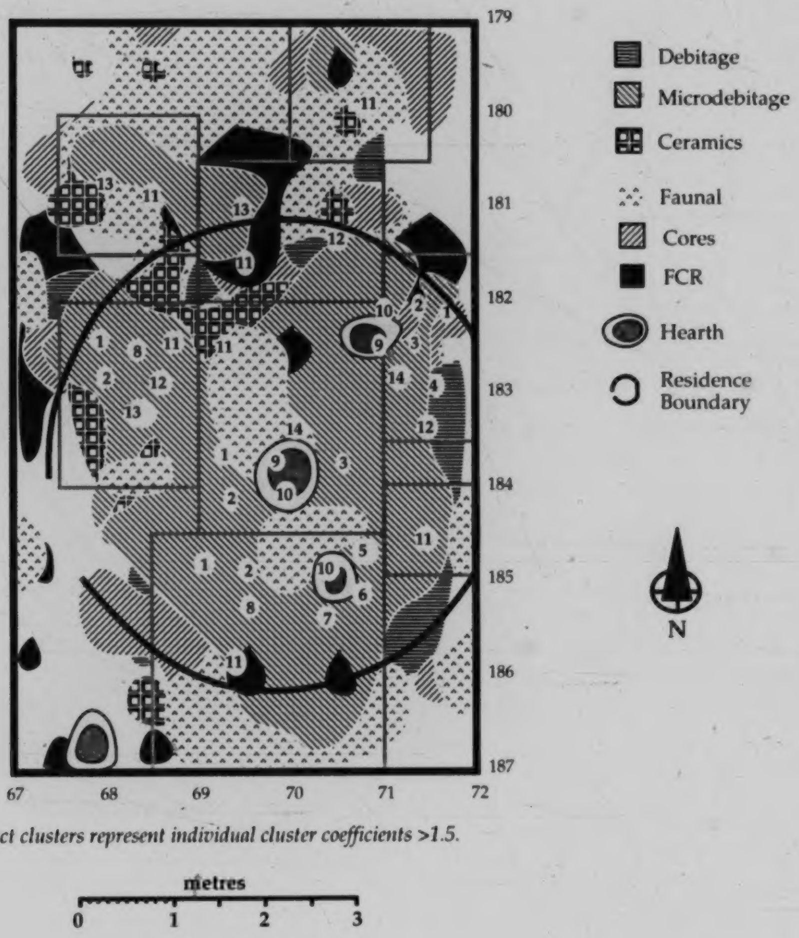


Figure 9.1. Activity area around main hearth of Block 2.3 exposed on occupation floor. Insets show location and *in situ* position of iron fragment adjacent to anvil stone.

located. The density of debris scatter would indicate that these areas would present something of an impediment to structure access, however. It is alternatively hypothesized that the entrance may have been located in the southwest, where debris was relatively lightly distributed. This direction also afforded a good view towards the upstream portion of the river. The apparently contiguous discard areas to the north and south may have been the result of discarding debris beyond the tent walls by lifting up the cover.

Most of the activities within this structure complex were strongly male-associated. Stone tool manufacturing apparently took place in the vicinity of two of the three hearths, and male-oriented ceremonial activity was especially apparent in the northeast portion of the dwelling. Trade-related social interaction may be reflected in the presence of the iron fragment found by the central hearth. The lithic industry is particularly intriguing, given its obvious intensity yet unusual lack of completed product. In the south half of the structure (and beyond in discard areas) almost all tools were broken (many bearing characteristic manufacturing-related fractures). This pattern suggests that there may have been some element of training taking place, perhaps novice flintknappers being educated in the finer points of stone tool craftsmanship. One external examiner of the stone tool collection in this area has remarked upon the general lack of proficiency in the product, in



Artifact clusters represent individual cluster coefficients >1.5.

- ● 1 - Lithic Reduction
- ● 2 - Stone Working
- ● 3 - Ochre Use
- ● 4 - Bone Working
- ● 5 - Hide Working
- ● 6 - Hide Preparation
- ● 7 - Small Animal butchering
- ● 8 - Bone Breaking
- ● 9 - Pot Cooking
- ● 10 - Roasting
- ● 11 - Cluster discard
- ● 12 - Primary Discard
- ● 13 - Scavenging
- ● 14 - Ceremonial Interaction

Figure 9.2. Interpreted activities of Sub-Block 2.3. Bullets (•) in legend show individual behaviours recognized in the block. Squares represent activity area boundaries.

comparison to other sites he has worked on where tool making was an important activity (Bob Dawe, personal communication, 1985).

Female activity correlates appeared around the southeastern part of the structure, where stone working was absent and a number of unbroken hide working tools were recovered. It is possible that women did work in this area, or that this area was used by men to carry out certain domestic chores usually associated with women.

There was not a great diversity of animals consumed within the dwelling area. As in most other areas, beaver and bison were the most well represented species (on the basis of their NISP). A significant quantity of bird specimens were also identified, but as of this writing had not been categorized to species. One foetal bison specimen and 10 immature beaver specimens were observed in the collection. When considered in conjunction with the considerable quantity of eggshell recovered from the area, and in the absence of conflicting seasonality data, the dwelling was probably extant during the middle to late spring of the year.

Use of Pottery in the Activity Complex

The remains of five vessels (V 21,27,34,36 and 37) were found in this area (see Figure 5.8 for vessel distributions). Vessel 36 consisted of a few tiny rim sherds recovered in two separate areas of the sub-block. Since it was possible that the fragments were intrusive to the area, the vessel is not discussed here. Remains of vessels 21, 27 and 34 were cluster recoveries found in several disposal areas northwest of the large central hearth and in the work area at the centre of the sub-block. Vessel 37 was found scattered throughout the area.

Based on the classification scheme developed in Chapters 7 and 8, one pot was used for boiling (Vessel 21) and the others for utility storage or some other non-heat related task (Table 9.1). Vessel 37 was heavily stained with ochre and may have been used to store or mix liquid paint. Vessel 34 was also stained on the exterior. The boiling pot (Vessel 21) was the largest vessel found in the activity complex, in terms of diameter. It was delicately made, with an inward flaring rim. Its long, straight rim resembled those of Vessels 42 and 43 from Sub-Block 2.2. The utility pots were somewhat smaller in diameter and had shorter rims which were nearly vertical, or flared inward (Table 9.2). Only one vessel from the sub-block possessed lip decoration, Vessel 34 (Table 9.2). The rim on this pot flared outward, and was one of the few specimens from the site that was not decorated by one or more rows of punctates.

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
21	Boiling	Undecorated	Prominent	Obliterated
27	Utility	Undecorated	Smoothed	None
34	Utility	Ext/Int	Prominent	No Bosses
37	Utility	Undecorated	Prominent	Clear

Table 9.1. Selected attributes of vessels associated with Sub-Block 2.3.

There appeared to be few differences in vessel form or decoration among Vessels 21, 27 and 37. This subjective evaluation closely parallels that of the objective analysis. The vessels exhibited straight, vertical rims, undecorated rim lips, and a single row of punctates. Vessel 34 fell outside this grouping because it displayed no punctate row and

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
21	96.0	3.3	19.2	0.7	0.6	0.8	0.7	0.4	0.6
27	96.0	2.2	12.1	0.9	0.7	0.8	•	•	0.8
34	86.0	2.6	11.5	0.7	0.6	0.7	•	•	0.7
37	89.0	2.5	12.1	0.6	0.6	0.5	0.5	0.4	0.5
Mean	91.8	2.7	13.7	0.7	0.6	0.7	0.6	0.4	0.7

LLip T=Lower Lip Thickness

Table 9.2. Selected metrics of vessels associated with Sub-Block 2.3.

exhibited a noticeably outflaring and decorated rim. It did not resemble the other three vessels, even though only portions of the rim and neck were present for study. However, both Vessel 34 and 37 were ochre-stained.

Sub-Block 2.3 was the only multi-activity area containing large hearths in which no cooking vessels were recovered. Paint stains were found on two utility pots; the third may have been used for water storage or other non-cooking purposes. The one boiling pot may have been used to boil water, perhaps for hot beverages or medicinal purposes. These vessel uses support the hypothesis that the primary activities being undertaken in the area involved only males, and were non-subsistence oriented. Although there was some indication that female-related activities occurred in the southeastern part of the activity complex, the lack of cooking pots (associated with women elsewhere on the site) seems to suggest that these activities could have been performed by men as well.

Despite the lack of cooking vessels, there was strong evidence that food was consumed in the area. A considerable amount of broken bone was found in several discard areas, the remnants of food which could have been cooked in ceramic vessels. However, the small hearth in the southeast part of the activity complex contained the remains of a beaver paw, which was presumably roasted over the fire. It is possible that roasting was the major cooking activity in this special residence, and that ceramic use was restricted to non-cooking purposes.

If it was a men's area, it may be that men were not adverse to using pots for their own ceremonial uses, but did not use them much for cooking (although there is evidence that they were amenable to the notion of boiling liquids in them). Unfortunately, there is no mention of this kind of "pot cooking" aversion in the ethnohistorical literature anywhere in northern North America (D. Russell, personal communication, 1994), so it is hard to determine the validity of this kind of interpretation. It is also possible that a few cooking vessels were used in the area, but did not break during use and were curated when the residence area was abandoned. However, considering the ubiquitous presence of cooking pots in most other parts of the site, their complete absence in the sub-block cannot be solely attributed to curation activity.

The lack of cooking vessels coupled with the presence of ceremonial activity (long-distance trade, smoking, paint making and using) significantly alters the character of this activity complex. It seems apparent that this area was more than a workshop and residence; indications are that it was also a centre for considerable special activity that has been rather loosely termed "ceremonial." Only one other area of the site showed the combination of special activities exhibited here, located in Block 3.

Block 3

Block 3 was located in a relatively isolated part of Bushfield West, in an area interpreted to have been in forest at the time of occupation. A large part of the block was nearly sterile of artifacts, except for two areas in which dense clusters of cultural material and hearth features indicated that significant activities once took place. One of these areas yielded impressive pottery remains, in combination with artifacts and features associated with male ceremonial activity (Figure 5.11). These remains were found in seven activity areas, whose contents are summarized in Figure 9.3.

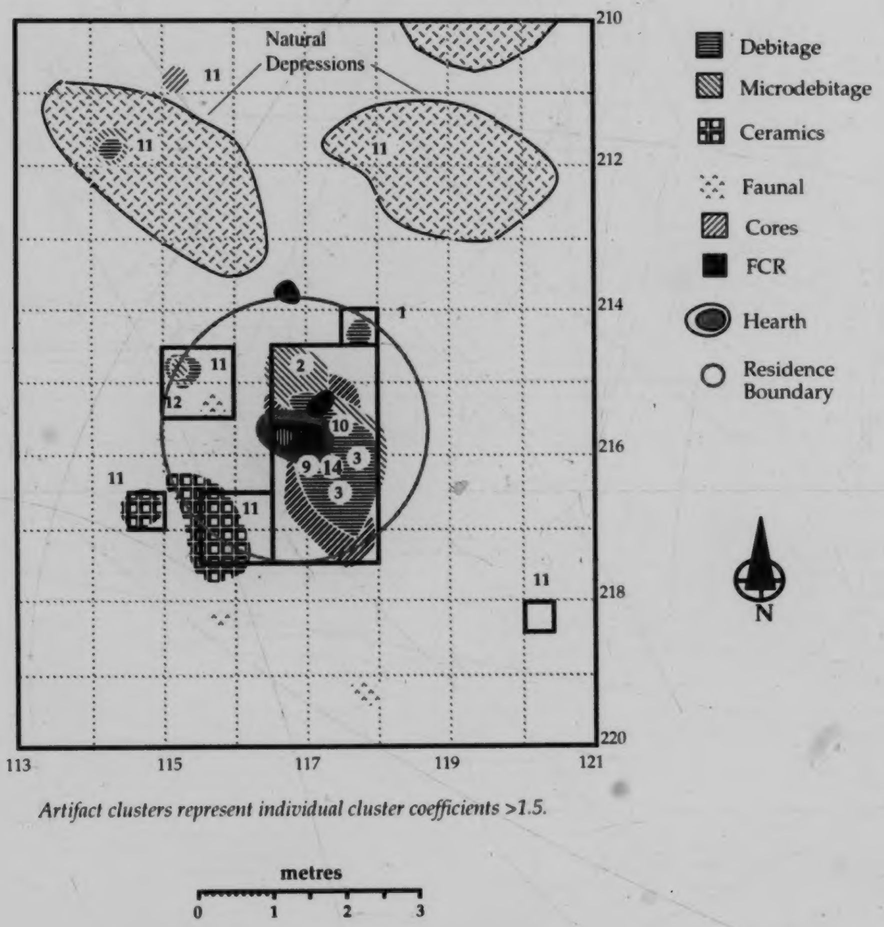
Activity Complex Interpretation

Through detailed analysis of the defined activity areas in the ceramic portions of Block 3, one dwelling area and the discard area of perhaps another can be defined. The unassociated Type 3 cluster discard area contains a rimsherd recognized as Vessel 23, and is probably related to a set of activities being carried out south of the excavated area. Little more can be stated about this hypothetical activity complex.

The complete activity area complex is definable through indirect and direct artifact/matrix cross-mends and adjacent related activities. The core of the complex is a hypothetical dwelling roughly centred upon a single, well-used hearth (Figure 9.4). The residence boundaries can be defined by the spatial orientation of significant activities surrounding the hearth. Using these criteria, the activity boundary (possibly demarcated by the boundaries of the tent area) was roughly 3.75 to 4.50 m in diameter. Within this enclosed area a number of separate activities can be recognized. For example, on the east and southeast sides, cooking, tool making and ochre preparation are hypothesized to have taken place. Occupants were cooking bison meat, possibly using at least one of the pots, and roasting immature beaver over the fire. Intensive stone working, from primary flake production to tool refinishing, was also carried out. Tool finishing and resharpening appears to have been the dominant activity around the hearth. Primary flake manufacturing may have taken place near the northeast edge of the structure.

Paint manufacturing was also an important industry. Several implements were found which obviously were used to prepare the material. As well, large ochre spills covered a significant portion of the living floor around the hearth, particularly on the east and southeast side; this distribution suggests ochre use.

There were three major discard areas within the dwelling: one was in the northwest corner, where bone, waste flakes and several bulky ochre making tools were expedi-



Artifact clusters represent individual cluster coefficients >1.5.

- ● 1 - LITHIC REDUCTION
- ● 2 - STONE WORKING
- ● 3 - OCHRE USE
- 4 - BONE WORKING
- 5 - HIDE WORKING
- 6 - HIDE PREPARATION
- 7 - SMALL ANIMAL BUTCHERING
- 8 - BONE BREAKING
- ● 9 - POT COOKING
- ● 10 - ROASTING
- ● 11 - CLUSTER DISCARD
- ● 12 - PRIMARY DISCARD
- 13 - SCAVENGING
- ● 14 - CEREMONIAL INTERACTION

Bullets (•) show individual behaviours recognized in block

Figure 9.3. Interpreted activities of Block 3. Bullets (•) in legend show individual behaviours recognized in the block. Squares represent activity area boundaries.

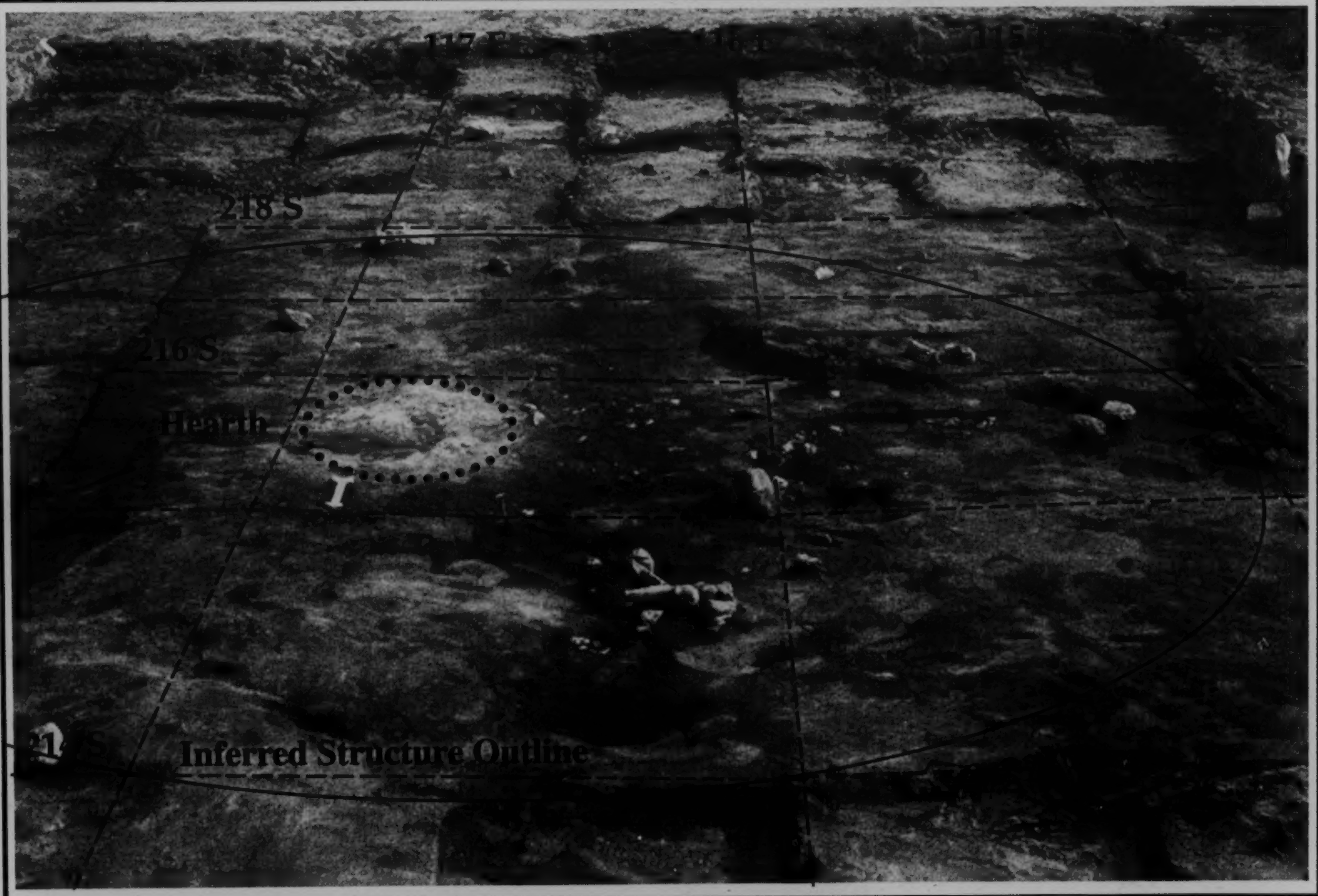


Figure 9.4. Exposed living floor around interpreted residence in Block 3, Bushfield West.

tiously dumped as Type 1 cluster discard; and a second was situated in the southwest, were a few broken tools, flakes and bone and a considerable quantity of pottery were discarded, possibly as Type 3 cluster discard. A third, also in the southwest, consisted exclusively of broken pottery. Except for its proximity to the living area (hence the possibility that it could have been expeditiously tossed away from the inhabited area of the dwelling), it resembled Type 3 cluster discard in its apparent purposeful placement of a whole broken pot, and parts of another, away from the living area. There was no significant Type 2 discard. Although a few flakes and some pot sherds were found in the ashy remains of the hearth, no great quantities of flakes, and in particular microdebitage, were found in comparison to other hearths on the site. In fact, some debris appeared to be found on top of the hearth ash, suggesting that it was not actively used at the time that some lithic working activities were taking place.

The west and southwest sides of the hearth were remarkably barren of cultural materials or features. During excavation of the hearth and its vicinity, it was noted that the area was relatively sterile, and that certain parts of the living floor appeared to have been compacted. This feature was in an area in which heavy equipment and been used to strip off the sterile overburden, and this activity may have accounted for part of the paleosol compaction. However, in other areas where tire passage had clearly deformed the occupation floor, this soil compression was not evident. Rajnovich (1983) used soil compaction as the primary means of defining residences at the Spruce Point site. It is possible that the artifact-free area may have been purposely left clean for sitting or sleeping, as would be found within an enclosed tent structure.

Beyond the structure, all other activity within the activity complex is related to dumping. The favoured Type 3 dumping areas appear to have been in the shallow depressions to the north of the structure, although dumping may also have occurred to the south where excavation was not carried out. The relative proximity of these exterior features suggests that the entrance to the structure was from the northwest, where waste could be easily dumped into depressions. This entrance would have been in the general direction of the main part of the Bushfield West encampment, assuming contemporaneous occupation. Immediately outside the dwelling, to the southwest, three dispersed ash patches were discovered, and interpreted to have been Type 3 ash discards from a hearth. Whether they came from the dwelling hearth is unknown. However, the pot conjoins from Vessel 1 indicate that the dumps to the north did come from the dwelling. In fact, when Vessel 1 broke, parts of it may have been thrown to the southwest as Type 1 cluster discard, and the remainder appears to have been thrown out as two separate Type 3 cluster discards, one consisting largely of debitage and microdebitage tossed into the depression to the north, and the other consisting of broken tools and debitage, but mostly pottery, outside of the structure on the southwest side.

The entire activity complex appears to represent the remains of a combination lithic workshop, ceremonial use area and residence. The flintknapping and paint use activities suggest that men were the principal occupants. The presence of egg shell, foetal bison remains and immature beaver faunal elements suggests that the activity complex was formed in the late spring.

Use of Pottery in the Activity Complex

In this block, the remains of three vessels (V 1, 8 and 14) were found in several large clusters southwest of a hearth and multiple activity area. Vessel 8 was found as a pot smash. Vessel 1 was found within the pot smash cluster, in disposal areas outside of the dwelling, and as a few sherds within the dwelling hearth itself. A large rim section of Vessel 14 was recovered in the general area of the pot smash. No other potsherds could be found anywhere in the excavated area which would cross-mend to it. This distribution suggests that the vessel fragment may have been intrusive. It is possible that it may have been part of the substantial ceramic assemblage recovered from the redeposited materials which overlay the occupation in this area. Although great care was taken to separate Reworked Sand artifacts from those *in situ,* it is conceivable that this one piece may have been missed. Since the origin of this vessel is strongly suspect, it is not considered here.

The two vessels from this area were of similar dimensions, and shared many attributes (Tables 9.3 and 9.4). Both exhibited lip decoration, although one vessel (V 1) displayed an exterior/interior cord-wrapped tool design, a decorative motif which appeared much less frequently in the Bushfield West assemblage than the exterior cwt lip impressions of the other pot. The most significant difference was in vessel use, and perhaps because of this, vessel form. Vessel 8 was lightly encrusted with patches of cooking residue on its neck and inner rim. The pot was probably used for light cooking purposes. Vessel 1, on the other hand, was a utility vessel. It possessed no trace of cooking residue, although there were a few burn patches on its base. In fact, part of this vessel was recovered from the hearth in the activity complex. One plausible hypothesis is that at the time Vessel 8 was lost, some attempt was made to use Vessel 1 for heating,

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
1	Utility	Ext/Int	Prominent	Trace
8	Lt Cooking	Exterior	Prominent	Clear

Table 9.3. Selected attributes of vessels associated with Block 3.

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
1	90.0	4.3	20.0	0.9	0.8	0.7	0.6	0.5	*0.7*
8	84.0	3.3	17.2	0.6	0.6	1.0	0.4	0.4	*0.6*
Mean	*87.0*	*3.8*	*18.6*	*0.8*	*0.7*	*0.9*	*0.5*	*0.5*	*0.7*

Table 9.4. Selected metrics of vessels associated with Block 3.

and that it broke up as a consequence. The majority of the pot was disposed in the area of the pot smash, and in the distant disposal area, and a few fragments which could not be fished out of the flames were left in the hearth.

From a subjective point of view, both pots were significantly different in form and decoration. Vessel 8 was a globular vessel, possessing a thin, rounded shoulder and a very thin wall. It was more delicately fabricated than Vessel 1, which appeared be much more robust than the mean vessel thickness statistic suggests. The two vessels also differed significantly in rim angle and length. Nevertheless, the two vessels were used in the same activity complex. This conclusion suggests that it was perhaps not unusual to have considerable diversity in subjective vessel styles within a single residence area on Bushfield West.

Since no part of Vessel 8 was identified in the fire, it is possible that the vessel was cracked during cooking use and discarded nearby. The failure of the cooking vessel may have prompted the fateful use of the utility vessel for cooking, with disastrous results. If this scenario is accepted (as speculative as it is) it would suggest that cooking pots in the residence area were in short supply and that others could not be borrowed. The location of this activity complex (hypothesized to have been in a wooded area) was distant from the other densely occupied parts of Bushfield West. It is possible that, at the time this residence area was occupied, there were no other households nearby from which cooking pots may have been borrowed.

CERAMIC VARIABILITY WITHIN WOMEN'S ACTIVITY AREAS

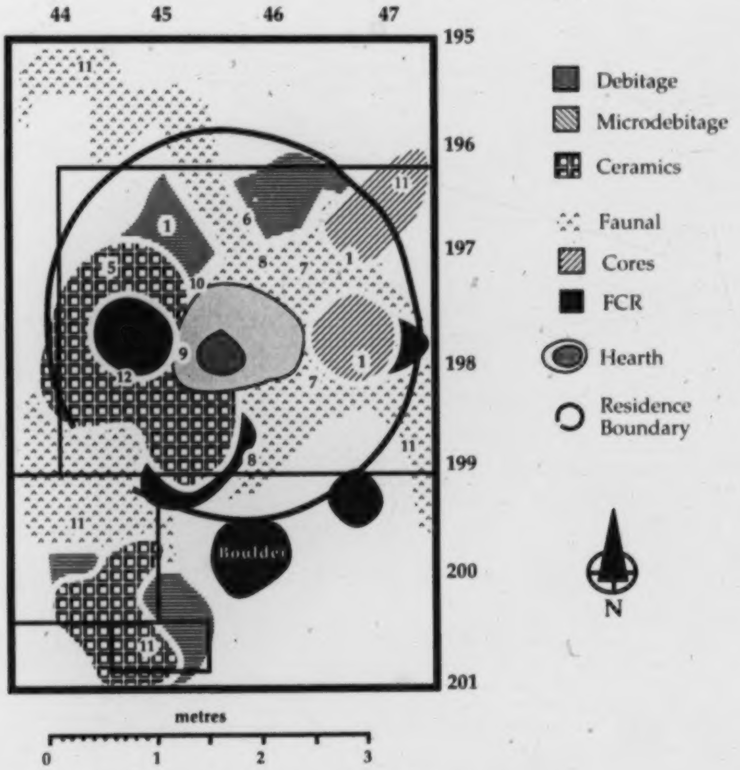
A number of excavated areas within Bushfield West appeared to exhibit activities characteristic of domestic behaviour within a dwelling. Some areas displayed disproportionately high numbers of activities associated with female behaviour. Tasks such as butchering, bone breaking, cooking, hide preparation and hide working were interpreted from remains that lacked concomitant male-oriented activities such as tool making and ochre processing. Two of these areas yielded considerable ceramic remains. One was found within Block 1 and another consisted of the incompletely represented parts of Block 8. Also, an isolated area on the south edge of the site produced pottery remnants which may have been the remains of an unsuccessful pottery firing episode. This area was discovered in Blocks 5 and 17.

Block 1

The northwest corner of Block 1 bore evidence of considerable human activity. The central feature was a small, artifact-laden hearth surrounded by dense, localized accumulations of lithic debris, many stone and bone tools, piles of broken pottery, scatters of fragmented and partially fractured bone and small clusters of fire-cracked rock (Figures 5.1, 5.2). This sort of debris configuration was observed in many other blocks, but certain aspects of the artifact composition were unique to Block 1. The most significant concentrations of materials appeared in Activity Areas 1.3, 1.4 and 1.5. They are statistically summarized in Figure 5.4.

Activity Complex Interpretation

The area encompassing the three activity areas appears to have been the focus of a domestic residence (Figure 9.5). The residence boundary appears to be a 3.5 m diameter area surrounding the central hearth. This is where most principal activities took place, including limited lithic reduction, bone working, clothing repair, hide preparation, small animal butchering, bone smashing, pot cooking and roasting. Secondary disposal was



Artifact clusters represent individual cluster coefficients >1.5.

- ● 1 - Lithic Reduction
- 2 - Stone Working
- 3 - Ochre Use
- 4 - Bone Working
- ● 5 - Hide Working
- ● 6 - Hide Preparation
- ● 7 - Small Animal butchering
- ● 8 - Bone Breaking
- ● 9 - Pot Cooking
- ● 10 - Roasting
- ● 11 - Cluster discard
- ● 12 - Primary Discard
- 13 - Scavenging
- 14 - Ceremonial Interaction

Bullets (•) show individual behaviours recognized in block

Figure 9.5. Interpreted activities from Activity Areas 1.1, 1.2 and 1.3 of Block 1. Bullets (•) in legend show individual behaviours recognized in the block. Squares represent activity area boundaries.

identified outside of this boundary. Debitage, pottery and bone were apparently disposed to the southwest (the area towards the river). Some bone was also ejected to the northwest and southeast.

A wide variety of animals were consumed in the residence. Although bison and beaver were predominant among identified animal remains, a considerable number of bird specimens were present, suggesting that fowl (particularly upland game birds) were important parts of the diet for the occupants of this residence. No eggshell was identified, and although there were collection problems connected with this artifact class, quantities of the material must have been very low, or nonexistent, to be missed entirely. Faunal seasonal indicators suggest that the residence was occupied in mid to late spring (late April, early May).

Most of the activities seemed to be female-associated; in fact there were few explicitly male-associated activities present in the block area. Particularly absent was evidence of stone tool making. Some lithic reduction apparently took place, but it did not seem to be part of an extensive stone tool industry where the results of the reduction were further modified. The tool kit was dominated by hide working and clothing repair tools, which were probably used by women. Some bone processing was evident, although the bone was not intensively smashed as in other parts of the site. This pattern does not necessarily mean that men were not present in the area, just that normally-associated male activities were not in evidence. Core reduction may have been done by one or more men although, as already discussed, there is no reason to assume that women would not have been able to reduce cores for expediency tool manufacturing.

Use of Pottery in the Activity Complex

The remains of six pottery vessels (V 2, 4, 12, 22, 65, 66) were found associated with the primary activity complex identified in this block. One pot (V 4) was recovered as part of a pot smash, four were collected as pottery clusters and one vessel remnant (V66) consisted of a few rim sherds which were scattered within and beyond the activity complex. The latter vessel may have been intrusive to the area, and is not considered in this discussion.

Using the analytical parameters established in Chapters 7 and 8, the pot assemblage or "tool kit" of remains for this residence area was represented by three light cooking and two utility pots (Table 9.5). The shattered remains of the cooking vessels (V 2, 4 and 22) were found within one metre of the central hearth. The most completely represented utility vessel (V 12) was recovered in a disposal area three metres south of the hearth. The other recognizable utility pot consisted of a single section of what may have been a tiny bowl, broken up near the hearth. Only the large utility vessel exhibited fingerprints, which were exceptionally clear and almost appeared to be a kind of interior decoration. The other vessels possessed no trace of prints. All vessels were fabric impressed, and all but one (V 2) displayed some form of decoration on the rim lip. All vessels were deco-

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
2	Lt Cooking	Undecorated	Prominent	None
4	Lt Cooking	Brim	Smoothed	None
12	Utility	Exterior	Prominent	Clear
22	Lt Cooking	Exterior	Smoothed	None
65	Utility	Exterior	Smoothed	None

Table 9.5. Selected attributes of vessels associated with Block 1.

rated with punctates.

The average rim angle for the collection of vessels from this area was approximately 83° (Table 9.6). This was an unusually prominent flare compared to other excavated areas of the site. Interestingly, the two utility vessels were among the most flared; two of the cooking pots exhibited almost vertical rims, which differed from the average for the site. Average rim diameter was also fairly large, at 17 cm, even though a very small vessel (V 65, a possible bowl) was represented in the statistic. Average rim length was also relatively long, at 4.4 cm. The mean metric values seemed to reflect the absence of boiling vessels in the activity area ceramic assemblage. Presumably, if these types of vessels would have been present, their shorter, vertical rims and smaller diameters would have moderated the mean values.

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
2	88.0	5.8	18.0	0.7	0.6	0.7	0.5	0.5	*0.6*
4	87.0	3.6	13.9	0.6	0.5	0.7	0.5	0.5	*0.6*
12	82.0	4.0	20.9	1.2	0.7	0.7	•	•	*0.9*
22	81.0	4.2	17.5	1.0	0.7	1.1	•	•	*0.9*
65	76.0	•	14.6	0.7	0.6	•	•	•	*0.7*
Mean	*82.8*	*4.4*	*17.0*	*0.8*	*0.6*	*0.8*	*0.5*	*0.5*	*0.7*

Table 9.6. Selected metrics of vessels associated with Block 1.

Subjectively, Vessel 4 appeared to be distinct from the other vessels recovered in the activity complex. With its prominent 'S' rim profile and large size it formed a subclass of vessels within the local assemblage. The only other vessels on Bushfield West which looked like this pot were from Sub-block 2.2. These were Vessels 39, a large utility pot, and Vessel 40, a small heavy cooking pot.

As described above, this activity complex was interpreted to have been the remains of a domestic residence. The major activities taking place in this area were food preparation, hide and clothing repair, and some amount of lithic reduction. Although there were indications that some bone had been broken up for cooking, intensive bone processing was not in evidence, even in the discard areas to the south and northwest. No significant stone tool manufacturing took place. Unlike in other areas of the site, male associated activities did not predominate; the area seemed to reflect general domestic maintenance rather that specialized activities.

The ceramics recovered from this area did not contradict these interpretations. The three light cooking pots were probably used for domestic cooking tasks. The uncommon lack of heavily encrusted cooking vessels correlated with the unusually complete animal bone remains identified in the area. One of the two utility pots (V 65) was the approximate size and shape of a tiny bowl, which would be expected to be used in a domestic context. No boiling vessels were represented, an absence which may have been a function of the limited vessel sample; or, as contended here, it may have reflected the limited kinds of food preparation activities which took place in the area.

Block 8

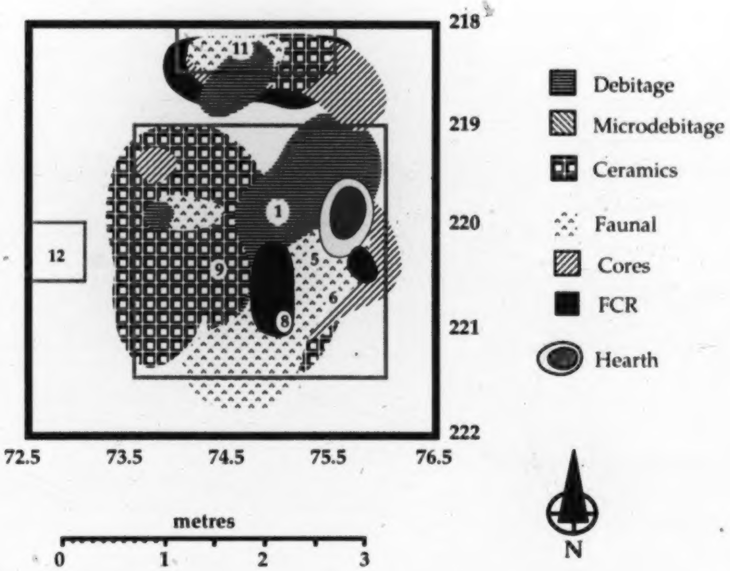
Although only a portion of the Block 8 occupation living floor was intact, a significant area of the interpreted residence was examined, including the central hearth area around which a great amount of cultural debris was clustered. Using the CCS, three activity areas were identified (Figure 5.22). Their content breakdown is summarized in Figure 5.23. Though three separate activity areas were defined within Block 8, it is probable that all were part of a single residence (Figure 9.6). The diversity and quantity of artifacts parallels that of other activity complexes. The only artifact class which is conspicuously absent is beaver bone.

In size and material quantities, the discoveries in Block 8 most closely resemble those from the western part of Block 3, interpreted to have been a men's residence and covered workshop area. However, under close scrutiny of the remains, Block 8's characteristics are significantly different. These differences are discussed in the following section.

Activity Complex Interpretation

Stone tool maintenance and manufacturing was not a major activity in Block 8. This interpretation is supported by the types and conditions of certain tools recovered (Table 5.3), and the relatively small amount of microdebitage recovered in the area. In Block 3, tool fracture patterns and the general incompleteness of tools suggested that they may have been broken during their manufacture or retouch, rather than through use. In Block 8, six knives and preform bifaces were found complete, and only one knife appeared to be broken. This feature suggests that although there may have been some tool maintenance taking place, tool manufacturing was not.

If there was no tool maintenance/manufacturing taking place in the residence, what was going on? A relatively large proportion of ground and pecked stones were found (two stones with grinding surfaces, and two with pecking surfaces). Nine retouched flakes were recovered as well. In the same area a small quantity of debitage, a token amount of microdebitage, but at least ten cores were collected. It is suggested that the



Artifact clusters represent individual cluster coefficients >1.5.

- ● 1 - LITHIC REDUCTION
- 2 - STONE WORKING
- 3 - OCHRE USE
- 4 - BONE WORKING
- ● 5 - HIDE WORKING
- ● 6 - HIDE PREPARATION
- 7 - SMALL ANIMAL BUTCHERING
- ● 8 - BONE BREAKING
- ● 9 - POT COOKING
- 10 - ROASTING
- ● 11 - CLUSTER DISCARD
- ● 12 - PRIMARY DISCARD
- 13 - SCAVENGING
- 14 - CEREMONIAL INTERACTION

Bullets (•) show individual behaviours recognized in block

Figure 9.6. Interpreted activities of Block 8. Bullets (•) in legend show individual behaviours recognized in the block. Squares represent activity area boundaries.

small quantity of debitage was the result of flakes being struck off cores with the primary purpose of securing expediency tools such as the retouched flakes recovered in the area. Other artifacts suggest that food preparation and hide processing were also taking place.

The residence in Block 3 was characterized by tool making and repairing, and preparation of materials (ochre) for ceremonial exercises, as would be performed by men. By contrast, the tools from Block 8 seem to indicate that hide working and meal preparation were more important; activities usually associated with women rather than men. This is the only area where a possibly intact tool kit was found, which included two bifaces and a celt (Figure 5.24). The bifaces probably served as efficient butchering tools. The celt may have been used for chopping bone, although tools of this type have been associated with wood chopping in other contexts. It is suggested that the area was used for domestic purposes, with the primary personnel being women.

Use of Pottery in the Activity Complex

Two rim sherds and approximately three quarters of a vessel rim and neck were collected from Block 8. The remains were identified as parts of three vessels (V 92, 93, and 94). Since only the central portion of the activity complex could be examined, it is possible that considerably more vessel remains would have been recovered in hypothetical discard areas peripheral to the complex centre. This distributional pattern would have been similar to that of most of the other activity complexes examined on Bushfield West. Unfortunately, these trash dumps, if they did exist, were destroyed by road construction. Only the central portion of the complex was preserved, and only one vessel (V 92) was sufficiently well represented to state confidently that it was part of the complex.

Vessel 92 was a relatively large, well-used cooking pot with a long, strongly flaring rim. It was covered with a very prominent exterior fabric finish (Table 9.7). In fact, though the finish had obviously been smoothed prior to firing, the exterior texture of this vessel was still so distinguishable that the fabric used to impress the clay must have been very coarse. It may possibly have been a coarse-corded, finely woven net bag. The vessel was also very robustly constructed, as indicated by the mean thickness of the vessel (Table 9.8). However, though its robust nature and coarse exterior finish served to separate this pot subjectively from the rest of the Bushfield West collection, it still fell well within the attribute and metric ranges manifested by these vessels.

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
92	Hvy Cooking	Exterior	Smoothed	None
93	Utility	Exterior	Smoothed	No Bosses
94	Indt Use	Brim	None	No Bosses

Table 9.7. Selected attributes of vessels associated with Block 8.

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
92	74.0	4.0	20.9	1.1	0.9	1.1	•	•	*1.0*
93	•	•	•	0.9	0.5	•	•	•	*0.7*
94	•	•	•	0.7	0.6	•	•	•	*0.7*
Mean	*74.0*	*4.0*	*20.9*	*0.9*	*0.7*	*1.1*	•	•	*0.8*

Table 9.8. Selected metrics of vessels associated with Block 8.

Although only limited excavation could be carried out in Block 8, a not insignificant amount of bone was collected. This material was so finely smashed that less than 30 pieces could be identified as to species or element. The one vessel which could be irrevocably associated with the activity complex was a heavy cooking vessel. The association of smashed bone with the remains of this type of pot and a hearth suggest that bone marrow rendering may have been one important activity which took place in the activity complex.

Block 5 and Block 17

The remains of one entire vessel (V 5) and single rim sherds from two others were recovered in one large, isolated pottery cluster during the test assessment operation. Despite extensive excavation (comprising Block 5) in the area surrounding the smashed pot, little additional evidence of human occupation was discovered. A few metres away, in a one square metre excavation unit in a disturbed area (designated Block 17), the remains of another small vessel were recovered. The occupation between the two blocks had been largely destroyed by cultivation. Therefore, the two areas could not be contiguously examined.

Use of Pottery in the Blocks

The four pots from the two areas were classed as utility vessels (Table 9.9), primarily because they possessed no food residue or secondary firing stains which could be used to identify them as cooking or boiling pots. All had been prominently impressed on their exteriors with fabric. Although the pots represented by rim sherds could not be fully measured, it was apparent that three vessels from the pot smash were probably quite large (Table 9.10), while the separated vessel was much smaller.

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
5	Utility	Exterior	Prominent	Obliterated
7	Utility	Interior	Prominent	Clear
56	Utility	Undecorated	Prominent	None
57	Utility	Undecorated	Prominent	Trace

Table 9.9. Selected attributes of vessels associated with Blocks 5 and 17.

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
5	82.0	3.8	18.2	0.9	0.6	0.9	0.7	0.6	*0.7*
7	84.0	1.8	7.2	0.6	0.5	0.6	0.7	0.3	*0.5*
56	•	4.7	•	0.7	0.5	•	•	•	*0.6*
57	92.0	5.1	27.4	0.9	0.6	•	•	•	*0.8*
Mean	*86.0*	*3.9*	*17.6*	*0.8*	*0.6*	*0.8*	*0.7*	*0.5*	*0.7*

Table 9.10. Selected metrics of vessels associated with Block 5 and Block 17.

Vessels 5, 56 and 57, despite the objective and metric differences, appeared to be from the same subjective class of pots. Though the latter two vessels were only represented by rim sherds, the form and size of their rims, the feel of their pastes, and their thicknesses favoured their classification as one and the same. Vessel 7 was different; it was a much more delicately constructed pot, with a differently formed rim. It was also much smaller than the other three pots.

Hanna (1983), in examining Vessel 5, concluded that a number of characteristics displayed by the remains suggested that the vessel had not survived the firing process. In particular, she noted that many of the sherds displayed hairline and star-shaped cracks and spalling (ibid.: 35), features which led her to suggest that the vessel may not have dried completely before being fired. She did not examine the rim sherd remains of Vessels 56 and 57, nor the large section of Vessel 7. These were subsequently studied by the author and found to exhibit the same kinds of paste cracks and spalling as found on Vessel 5. It was concluded that the additional three vessels probably suffered the same hypothetical fate as the completely represented vessel examined by Hanna. Even though the area around the pot smash and the second isolated pot had been disturbed by cultivation, there was little indication that any kind of habitation had taken place there to the extent that occurred 200 m to the north, where similar pottery clusters were encountered. The remoteness of recoveries, and the dearth of associated artifacts, tend to support Hanna's (1983) hypothesis that the clustered sherds were not the product of pots which had failed during use, but were the remains of vessels which had failed to survive the firing process.

The possibility that a pottery firing hearth could exist in the locality was investigated. Unfortunately, large scale grading around the blocks revealed that most of the occupation floor in the area had been badly disturbed by cultivation. If a hearth had been located in the area, most traces had disappeared prior to exposure of the paleosol remnants. Surface recoveries of artifacts were very scant in the vicinity of the block, unlike in other areas in which a productive archaeological living floor had been disturbed by cultivation. Thus, the area was probably somewhat peripheral to the main area of occupation for the site, and may indeed have been used for firing pottery vessels.

CERAMIC VARIABILITY WITHIN GENERAL CAMPSITE ACTIVITY AREAS

There were areas within Bushfield West which did not appear to exhibit the specialized, gender-related activities described in the previous chapters. In these localities there was strong evidence that both men and women were using the same area when they were carrying out day-to-day domestic activities. Located within Block 2, the two areas were fully defined by excavation. Ceramic recoveries were relatively abundant in both areas. The characteristics of the pottery appeared to reflect the multi-gender, multi-behavioural character of the localities.

Sub-Block 2.1

This block was located directly south of the hypothesized male-associated residence/

workshop area, in the southeast corner of Block 2. Several hearths and a dense artifact scatter were encapsulated within it (Figure 5.8). Four separate activity areas were identified, although the bulk of the artifacts, including the pottery, came from one large, dense scatter. The content of the activity areas is characterized in Figure 5.10.

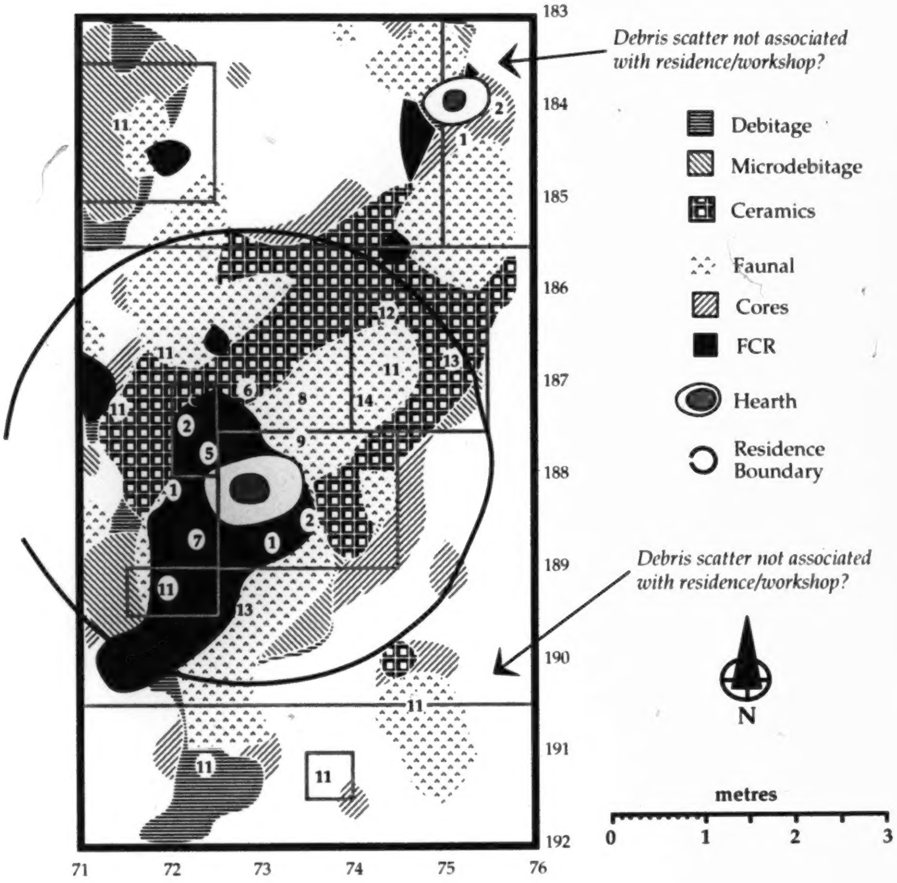
Activity Complex Interpretation

The quantity and diversity of cultural debris scattered within Sub-Block 2.1 appears to be indicative of a residence and workshop (Figure 9.7). Lithic tool manufacturing was by far the most archaeologically visible activity taking place. Tools were apparently manufactured in the southwest half of the area, and the debris collected and deposited as Type 1 cluster discard in a midden to the northeast. Within this lithic workshop area other domestic activities also took place, including some hide working, animal processing, bone smashing and cooking. Cooking may have been done in pots; most of the bone bore no evidence of charring (except for the fragments found directly within the hearth ash), and very little fire-cracked rock was recovered. Most of the more complete pots were thrown onto the midden debris northeast of the hearth, extending beyond the hypothetical boundary of the residence.

As in other areas of Bushfield West, bison and beaver were the favoured animals for consumption. A significant quantity of fowl, principally grouse, were consumed as well. Seasonality indicators were few, but seemed to suggest a late spring occupation of the sub-block.

Although an intensive amount of activity must have taken place to generate so much waste lithic material and bone, the material scatter was confined to a 4 m diameter area surrounding the large hearth, with most waste extending north, south and northeast. Much of the debris was Type 1 cluster discard, to judge from the heterogeneity of the debris piles, rather than simply drop discard. This kind of discard was most prominent to the north of the hearth, and especially to the northeast. This distribution suggests that the workshop may have been bounded by a structure such as a tent. One Type 3 cluster discard area was positively identified on the south side, based on ceramic conjoins which appeared inside and outside of the hypothetical residence boundary. Interestingly, lack of ceramic conjoins suggests that several disposal areas may not have been part of this activity complex. A debris pile in the northwest was more probably associated with Sub-Block 2.3. Much of the material to the northeast apparently was associated with a small activity complex associated with a hearth in that location. In the southeast, two small dump areas apparently had no identifiable associations, though they contained identifiable remnants of Vessel 28 and possibly Vessel 25. As a consequence, it is possible that these two vessels are not associated with activities in Sub-Block 2.1.

The only relatively clear area of this activity complex was to the west of the hearth. If it is assumed that the entrance would be kept clear of debris, the doorway to the dwelling was situated in this direction, away from where all of the debris was disposed. A



Debris scatter not associated with residence/workshop?

Debris scatter not associated with residence/workshop?

Artifact clusters represent individual cluster coefficients >1.5.

● 1 - Lithic Reduction
● 2 - Stone Working
3 - Ochre Use
4 - Bone Working
● 5 - Hide Working
● 6 - Hide Preparation
● 7 - Small Animal butchering
● 8 - Bone Breaking
● 9 - Pot Cooking
10 - Roasting
● 11 - Cluster discard
● 12 - Primary Discard
● 13 - Scavenging
● 14 - Ceremonial Interaction

Bullets (•) show individual behaviours recognized in block

Figure 9.7. Interpreted activities of Sub-Block 2.1. Bullets (•) in legend show individual behaviours recognized in the block. Squares represent activity area boundaries.

much smaller debris scatter was documented to the south of the hearth area, which may have been an area where debris was tossed out of a convenient opening in the fabric, or carried outside and dumped beside the structure.

Most of the identified activities within the structure area appeared to be male-associated. Obviously intensive stone working was an important indicator, but an equally important clue was provided by the recovery of exotic imported shell (dentalium) from the midden, presence of which shows that some form of trade took place, possibly involving ceremonial interaction, which in turn suggests that men may have been the primary personnel involved. Since the material was discarded in the midden, it may have been present in larger quantities in better condition when exchange for the material took place.

Despite the strong indications of male-associated behaviour in the area, there was some evidence that women were active in the residence as well. Hide-working tools were relatively abundant, and did not seem to be rejected products of the tool manufacturing taking place there. The wide variety of processed faunal remains attests to the importance of food preparation and consumption. Rather than being an exclusive men's residence or covered workshop, it is quite possible that the area was the location of a commensal family dwelling.

Use of Pottery in the Activity Complex

The remains of nine vessels (3,11,15,19,25,28,32,51 and 52) were recovered from this activity complex. Five vessels were collected as part of a single cluster and one as a multiple cluster, and the other three were either scattered or isolated fragments. Vessels 3, 11, 15, 19, 25 and 32 were the best represented. With the exception of vessels 11 and 25, they were found in an area northeast of the large hearth in the sub-block. The latter vessels were recovered several metres south of the hearth. Vessels 28, 51 and 52 consisted of tiny sherds which may have been intrusive to the sub-block; they are not considered in this discussion. Vessel 25 is problematic in that it was found not associated directly with the southeast debris dump and yet was not represented elsewhere in the general debris scatter associated with activity complex.

The five vessels which unequivocally came from the activity complex were a boiling vessel, a utility vessel and three heavy cooking pots (Table 9.11). Vessel 25 was also a

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
3	Boiling	Exterior	Prominent	Obliterated
11	Hvy Cooking	Undecorated	Smoothed	Obliterated
15	Utility	Exterior	Smoothed	Clear
19	Hvy Cooking	Exterior	Smoothed	Obliterated
25	Hvy Cooking	Undecorated	Smoothed	None
32	Hvy Cooking	Ext/Brim	Prominent	Clear

Table 9.11. Selected attributes of vessels associated with Sub-Block 2.1.

heavy cooking pot. The utility vessel was light orange in colour and appeared to have been poorly fired. It was entirely unstained. The rest of the vessels were somewhat darker in appearance and, with the exception of the boiling vessel, possessed thick residue deposits on their interior rims.

The vessels from this area exhibited considerable variation in size and form (Table 9.12). Most had moderately out-curving rims, with the exception of the single boiling vessel. This pot possessed a slightly incurvate, short rim, and was smaller in diameter than all but one vessel. It also appeared to be less robustly manufactured than the other vessels. Interestingly, Vessel 25 was significantly smaller in rim length (32%) and orifice diameter (36%) than the average for the six-vessel collection.

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
3	92.0	2.4	14.4	0.7	0.6	0.7	0.6	0.4	*0.6*
11	86.0	3.5	16.2	0.9	0.8	0.7	•	•	*0.8*
15	85.0	3.9	27.4	0.8	0.6	0.8	•	•	*0.7*
19	86.0	3.8	15.6	0.8	0.6	0.5	•	•	*0.6*
25	85.0	2.1	10.9	0.7	0.6	0.6	•	•	*0.6*
32	76.5	2.9	16.8	1.0	0.8	0.7	•	•	*0.8*
Mean	*85.1*	*3.1*	*16.9*	*0.8*	*0.7*	*0.7*	*0.6*	*0.4*	*0.7*

Table 9.12. Selected metrics of vessels associated with Sub-Block 2.1.

All vessels possessed fabric impressions on their exterior, and exhibited a single row of punctates. Two of the six vessels had rims which were undecorated; the others exhibited cord-wrapped tool impressions on their lip exteriors (one vessel possessed indistinct impressions on the brim as well). In fact, there were so few decorative differences between any of the vessels that the presence of lip decoration proved to be a compelling visual classificatory variable. When subjectively viewed as a collection, the rim-impressed pots appeared to form one group and the smoothed-rim vessels formed another. This impression seemed to override the vessel form and colour differences exhibited by the boiling and utility pot. This observation suggests that subtle forms of lip decoration may have been very powerful stylistic indicators within a collection of pottery vessels in which decoration seemed to be de-emphasized.

The already anomalous Vessel 25 did not possess lip decoration, nor did it bear any trace of fingerprints on its bosses. Significant differences in size and decoration between this vessel and others in the activity complex would seem to indicate that it was indeed intrusive to the area. This observation further supports the contention that the activity complex was physically separated from adjacent areas, probably by the cover of a tent. It was possible that the vessel fragment was tossed towards the tent during disposal or for some other reason, and fell down alongside it, along its base.

The ceramic recoveries were a mixed lot of heavy cooking, utility and boiling pots. The heavily encrusted cooking vessels could be directly correlated with the presence of a large quantity of smashed bone and a large, well-used hearth. Found together, they suggest that bone was being rendered to extract marrow. The utility and boiling pots were anomalously associated with all the evidence of intensive cooking activity. They were possibly used for non-food processing activities such as boiling liquids or storage.

This area was interpreted to have been a combination lithic and domestic chores workshop and residence. Although the most visible remains suggest male-oriented activity, female-associated activities were also in evidence, including hide working and bone smashing. In particular, the predominance of heavy cooking pots in the residence area provides a powerful argument for the presence of females in the area. As implied above, heavy cooking pots found elsewhere on the site were associated with bone grease manufacturing activities. The presence of these kinds of vessels in this activity complex seems to indicate that there may have been some intensive cooking taking place here, or that vessels from this area had been used for such purposes in a nearby area.

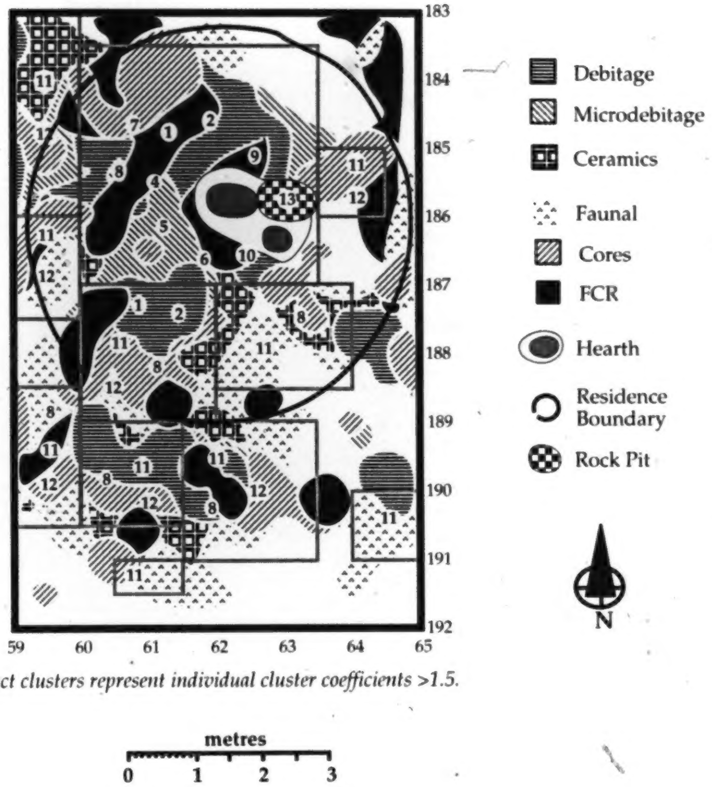
It is not known whether the hypothetical male and female activities took place simultaneously or at separate times, but the midden-like deposit to the northeast of the heavily used hearth contained a homogeneous mixture of flakes, potsherds and smashed bone. This material seems to suggest that waste was thrown out synchronically, and not sequentially. The latter process of disposal presumably would have resulted in stratigraphic layering of bone and debitage.

Sub-Block 2.2

This area was located west of Sub-Block 2.1, on the west side of Block 2. A number of activity areas were identified within it, as shown in Figure 5.11 and characterized in Figure 5.13. A considerable quantity of pottery, yielding many reconstructable vessels, was recovered. This area was unique in that it exhibited characteristics which suggested that it was a covered residence, and also the centre of food processing activities which are normally believed to have been carried out in an unsheltered area.

Activity Complex Interpretation

The most widespread activity within this block was bone smashing, which appeared to be centred in the block's southern half. The purpose of this activity was probably to furnish fresh smashed bone for cooking and perhaps bone rendering, which took place around the two hearths and rock pit in the north half of the block (Figure 9.8, 9.9). The heating features appeared to be located to one side of an activity complex in which stone tool manufacturing, bone working, clothing maintenance, butchering and cooking took place. The features and the primary discard debris associated with these activities could be contained within a five to six metre diameter area which would demarcate the boundary of a possible dwelling. Only areas of Type 3 cluster discard and bone smashing were located beyond this locality of complex activity. Although excavation was incomplete,



Artifact clusters represent individual cluster coefficients >1.5.

- ● 1 - Lithic Reduction
- ● 2 - Stone Working
- 3 - Ochre Use
- ● 4 - Bone Working
- ● 5 - Hide Working
- ● 6 - Hide Preparation
- ● 7 - Small Animal butchering
- ● 8 - Bone Breaking
- ● 9 - Pot Cooking
- ● 10 - Roasting
- ● 11 - Cluster discard
- ● 12 - Primary Discard
- ● 13 - Scavenging
- 14 - Ceremonial Interaction

Bullets (•) show individual behaviours recognized in block

Figure 9.8. Interpreted activities of Sub-Block 2.2 Bullets (•) in legend show individual behaviours recognized in the block. Squares represent activity area boundaries.

discard and bone processing was most prevalent on the south side of the residence beyond its hypothetical boundary. Much waste debris may have been ejected from the feature area to the southwest, in the area where bone processing took place. This may have been where the entranceway to the structure was located. Although the debris may have hampered access, if bone smashing were also taking place, the immediate entrance to the hearth and pit area may have been quite expedient. Some debris may have been ejected to the northwest as well, but limited excavation in that area could not verify the actual extent of artifact dispersal in that area.

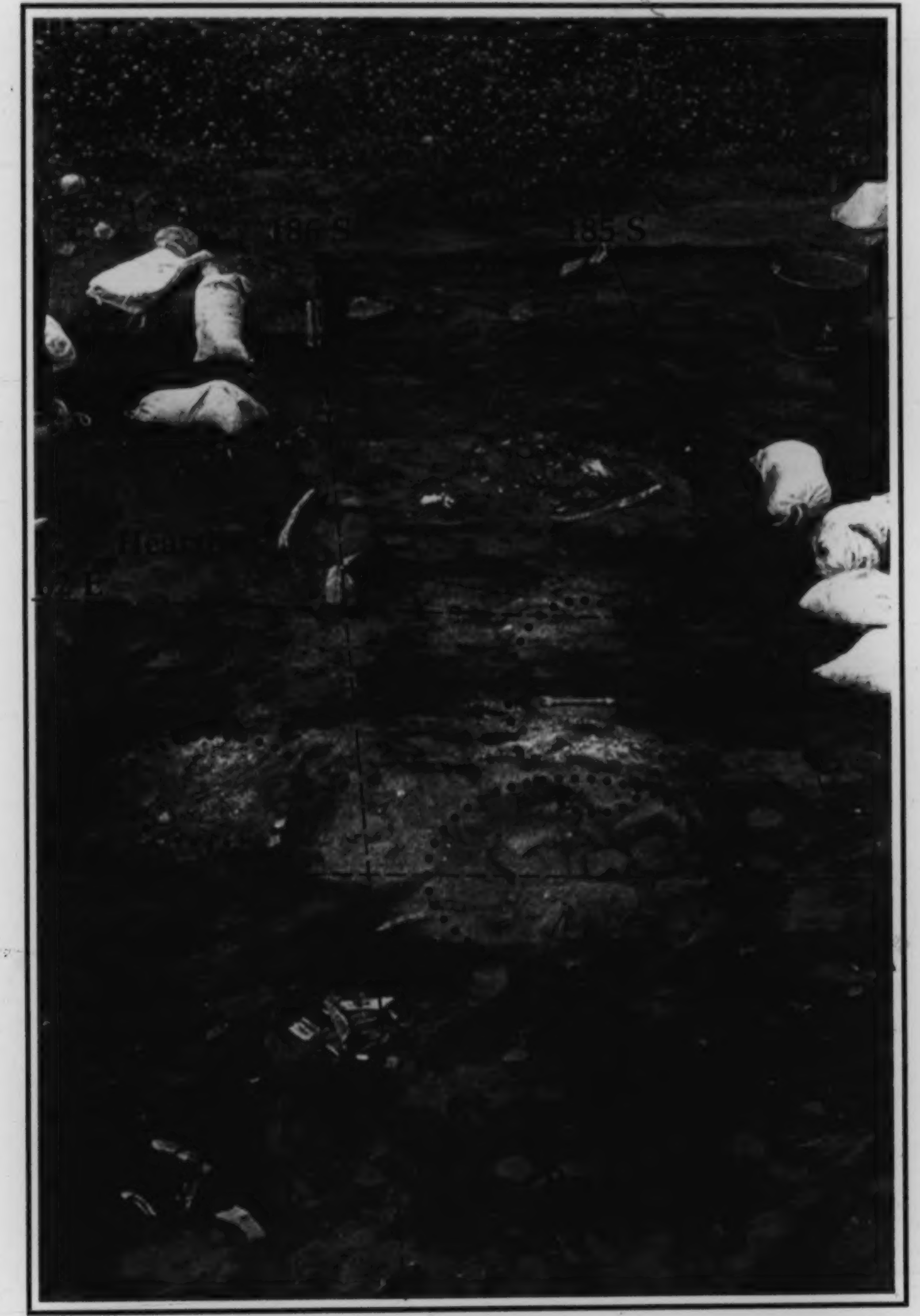


Figure 9.9. Exposed living floor of Block 2.2, showing rock pit and associated hearths.

There seemed to be a mix of male and female activities taking place in the sub-block. Intensive stone and bone tool making, and lithic reduction was undertaken in the area west of the hearth features. Evidence of female-associated hide working was not conclusive, but small mammal butchering and bone processing, previously associated with women's work elsewhere on the site, were.

Bone processing and marrow rendering was probably the most dominant activity, in terms of debris generation and physical activity. Bone was apparently splintered a few metres south of the structure, then carried to the double-hearth area. The exact rendering method remains speculative, but can nevertheless be hypothesized. Based on ethnographic and archaeological data (for a thorough summary of bone boiling pit characteristics see Dyck 1977: 263-270), a popular method of rendering bone entailed excavation of a shallow pit in the ground, lining it with a water-impermeable covering, then filling it with water. The water was brought to a simmer by adding hot rocks. Comminuted bone was then added, and as the fat rose to the surface, it was skimmed off for storage. However, most archaeological excavations of these features find considerable quantities of bone mixed in with the rock. The fire broken rock pit in this activity complex contained virtually no bone.

Similar rock features such as this were found at the Lloyd Site (Quigg 1983: 94-105), which was located less than two km away from Bushfield West, on an adjacent river flat. Pottery from the Lloyd Site is very similar to that of Bushfield West; and it is possible that the site was occupied by the same people as was this site, although at a different time. The excavator, M. Quigg, was unable to come to a conclusion about what the features were, also noting their lack of bone. He suggested that they may have been the remains of sweat lodges. This interpretation does not seem plausible in light of other probable sweat lodge discoveries in the region (Finnigan 1986), and on Bushfield West itself. These activities were never associated with fire broken rock pits, nor were they found in areas where any kind of human activity took place nearby.

As an alternative, it is hypothesized that the pit in this activity complex was used for bone boiling. It was located in a sheltered habitation, perhaps because it was too cold outside to do the work comfortably otherwise. The pit was lined with a skin, filled with water, and hot rocks added as needed from the adjacent fire to keep the water hot enough to render bone splinters, which were brought in from the south side of the structure. When boiling was complete, the rocks were removed from the pit, and the skin was taken outside and its soggy contents dumped away from the living area as Type 3 cluster discard. Since the residence was still inhabited, the larger rocks were pushed back into the hole out of the way. This action would account for the relative lack of bone in the rock pit, since it had been discarded. Since the pit was small, it is possible that it was also used as a makeshift stewing container as well, and the liquid consumed.

It is difficult to see how an intensive stone working industry and a bone processing operation could have been undertaken simultaneously. The heat from the rock pit and hearths must have been too intense within a confined structure to manufacture tools successfully. Also, the physical activity of people carrying in broken bone and fuel for the fire must have been somewhat disruptive. In fact, it is probable that the two major activities were not undertaken at the same time. An important clue supporting this idea is the intrusion of the fire-cracked rock pit into the larger, west hearth, suggesting that this was the original fireplace in the structure. Almost all of the microdebitage remains were located around the north, west and south of this feature.

If the two major activities were not simultaneous, the implication is that the area was reoccupied at a later date. However, the distributions of lithic and waste bone debris, hypothetically from different operations, were found to coincide almost exactly. Given the area available on Bushfield West, and the fact that there was a great deal of space on the occupation floor where no occupation whatsoever was identified, the overlapping of use areas seems too coincidental. Therefore, it is hypothesized that the two operations were undertaken at different times, but by members of the same "household" or commensal unit. It is suggested that tool making was probably initially carried out within a covered dwelling by men of the household. Their primary working area was probably west of the large central hearth. At some point tool making was discontinued (the men chased from the dwelling?), a rock pit was dug into part of the (by then) extinguished hearth, and a second hearth started to the south of the pit. Even with both hearths and the rock pit in operation, the dwelling may not have been moved, although the covering was probably pulled back to vent some of the heat. This action may account for the debris dumping in the northwest side of the structure, where the cover was lifted for tossing out waste, such as the remains of Vessel 39 and 42 (Figure 5.7). Bone smashing was initiated in the areas where cooking and lithic debris had been previously disposed of. Extensive cooking (and perhaps bone grease rendering) was then intensively undertaken, probably by the women of the household.

The animals that were processed were almost entirely beaver and bison. A large proportion of the identifiable parts from these two species were from skulls. Not being easily cooked or rendered, these parts were probably not smashed beyond recognition. One foetal bison element was identified. Almost a quarter of the identifiable beaver remains (nearly all of the ageable specimens) were from immature animals. These data, in combination with the recoveries of egg shell in the vicinity of the hearths, suggest that the dwelling was occupied in the middle to late spring, as in the other areas of the site.

Use of Pottery in the Activity Complex

Fragments representing 14 vessels were recovered from this sub-block (6,10,18,38, 39,40,41,42,43,44,45,49,61 and 62). Most vessels were represented by large rim and neck sections, recovered in single clusters rather than as distributions throughout the area. Vessels 18, 49, 61 and 62 consisted of single rim sherds or very small portions of vessels. Since they may have been intrusive to the sub-block, they were not considered in this study. Nearly all the area-associated pot remains were collected in the vicinity of the rock pit/hearth features located in the north part of the excavated area. Parts of vessels 43 and 45 were found clustered in this area, but significant portions were also found in disposal areas up to five metres south of the features. Vessels 10 and 38 were recovered south of the features in disposal areas.

There was considerable variability in vessel form and style within Sub-Block 2.2. This variability did not appear to be based on vessel function, or on any stylistic characteristic (Table 9.13). All vessels in the sub-block exhibited punctates, but one cooking vessel possessed a double row of punctates, the only multiple punctate row vessel recovered from the excavated portions of Bushfield West. Cooking, boiling and utility vessels possessed decorated and undecorated rims. There was an unusually high incidence of decoration on brim lips, but this seemed to also crosscut vessel function. Only one vessel possessed exterior rim decoration.

Vessel	*Use Wear*	*Lip Dec*	*Fabric*	*Prints*
6	Hvy Cooking	Brim	Prominent	Clear
10	Utility	Brim	None	None
38	Utility	Brim	Smoothed	None
39	Utility	Exterior	Smoothed	None
40	Hvy Cooking	Brim	Smoothed	None
41	Hvy Cooking	Undecorated	Prominent	None
42	Hvy Cooking	Interior	Prominent	Trace
43	Boiling	Undecorated	Prominent	Clear
44	Boiling	Brim	Prominent	None
45	Hvy Cooking	Ext/Int	Prominent	Clear

Table 9.13. Selected attributes of vessels associated with Sub-Block 2.2.

Vessel form was somewhat variable as well (Table 9.14). The average vessel diameter was only 14 cm, yet the vessel diameter range was between 6 and 25 cm. The boiling vessels tended to be small in size and the cooking pots tended to be the largest. However, two reconstructed cooking pots measured under 10 cm in diameter. Cooking pot rims showed significant flare (except for Vessel 41) but ranged in length from two to six cm. Utility vessels ranged from six to 20 cm in diameter.

Vessel variability was exemplified additionally by the subjective separation of the vessels into three categories of style and shape. One "style" category consisted of a cooking and a utility vessel (Vessel 39 and 40). These pots significantly differed in size and paste composition, yet exhibited strikingly similar 'S'-shaped rim forms. They closely resembled the unique form of Vessel 4 from Block 1. A second style category, represented by Vessels 6,10,44 and 45, consisted of pots which varied in size, but exhib-

Vessel	*Angle*	*Length*	*Diam*	*Lip T*	*LLip T*	*Neck T*	*Shld T*	*Wall T*	*M. Thick*
6	54.0	3.3	22.3	1.0	0.8	1.0	0.5	0.5	*0.8*
10	85.0	1.5	6.0	0.3	0.3	0.4	0.7	0.6	*0.5*
38	86.0	2.5	9.3	0.6	0.5	0.5	•	•	*0.5*
39	76.0	4.4	20.0	0.7	0.6	0.8	•	•	*0.7*
40	84.0	3.5	9.6	0.5	0.4	0.6	0.4	0.3	*0.4*
41	90.0	2.1	9.3	0.6	0.5	0.5	0.7	0.3	*0.5*
42	83.0	6.2	16.7	0.8	0.6	0.6	0.6	0.4	*0.6*
43	91.0	6.0	9.4	0.8	0.6	0.5	•	•	*0.6*
44	71.0	2.0	12.9	0.5	0.7	0.7	0.6	•	*0.6*
45	76.0	3.2	24.7	0.9	0.6	0.8	•	•	*0.8*
Mean	*79.6*	*3.5*	*14.0*	*0.7*	*0.6*	*0.6*	*0.6*	*0.4*	*0.6*

Table 9.14. Selected metrics of vessels associated with Sub-Block 2.2.

ited strongly flaring rims and unusually intricate lip decoration which tended to emphasize the brim area. The third style consisted of vessels with rims which were quite long in comparison to their rim diameters (Vessels 42 and 43). Two vessels from the sub-block (V 38 and 41) could not be subjectively categorized. They seemed to fit midway between the first style and the third. Of the three subjectively defined "styles", the one exhibiting prominent rim flares and unusual lip decoration appeared to be the most internally homogeneous. This style did not appear elsewhere on the site.

Generally speaking, the vessels within Sub-Block 2.2 showed much less homogeneity in form and decoration than those of other excavated areas. This feature may have been a function of the activity which was hypothesized to have taken place in the area. It will be recalled that the distribution of debris within the sub-block suggested that the area was originally used for specialized lithic working and domestic activities. At some point, the area was hypothesized to have been used for marrow rendering. When this activity took place, the hearth was expanded and a pit excavated and filled with rocks. Bone was smashed intensively, some of it apparently dumped into clay pots for cooking, although it is suspected that most was dumped into the rock pit for pit rendering using heated rocks. This activity would explain the presence of a large number of heavy cooking pots and the concomitant total absence of light cooking pots. These vessels, bearing thick encrustation of cooking residue, are hypothesized to have been used in the marrow extraction process which may have taken place in the area. The diversity of pot forms and decorative attributes (small and large rim lengths and diameters, multiple punctate rows, varied rim decoration) suggest that several households may have been participating in the bone smashing activity. This kind of communal activity and the varied remains left behind could be expected during a labour-intensive bone rendering operation carried out by a group consisting of multiple coexisting households.

Before this hypothetical activity was undertaken, male-associated tool manufacturing was interpreted to have taken place. It was during this time that the boiling vessels and at least a few of the utility pots may have been utilized.

THE RELATIONSHIP BETWEEN CERAMICS AND ACTIVITY COMPLEX BEHAVIOUR

In Chapter 1 it was argued that through the evaluation of the distribution and use of ceramics within the context of campsite behaviour, the interpretation of Selkirk archaeological components could be enhanced. In this study the ceramic assemblage was accordingly used less as a tool for linking activity complexes, and more for helping to define the behaviour which took place within the complexes. In the process, the ceramic recoveries were used to test certain hypotheses generated concerning the personnel who probably produced the remains in each residence/workshop area.

Bone rendering for the production of marrow fat was predicted to have taken place in Sub-Block 2.2 because of the way in which smashed bone had been distributed around a complex hearth and rock pit feature, and in the possible bone smashing implements found strewn about with the smashed faunal remains. Half the vessels identified in these locations were heavy cooking pots. The recovery of heavy cooking pots was in strong agreement with that interpreted activity. In Sub-Block 2.3, male ceremonial and other male-oriented activity dominated in most areas of the activity complex. There were no cooking pots in this same workshop and residence area. Pottery was apparently used only for boiling liquids and possibly for containing liquefied ochre; cooking activities appeared to be limited to roasting over an open fire.

The hypotheses were upheld to some extent elsewhere as well. Interpretations suggested that Sub-Block 2.1 was occupied by both genders. It was concluded that both men and women must have made use of the area, given the mix of activities interpreted from the non-ceramic remains. Pottery recoveries bore out this interpretation; four of the six pots identified in the area were used for cooking (and possibly bone grease rendering, given the amount of smashed bone). The pot remnants appeared to corroborate the overall interpretation that the area was probably a commensal residence. Ceramic recoveries appeared to corroborate the activity complex interpretations made for Block 1 and Block 8. In those locations subsistence and hide-working activities were dominant. Cooking pots were among the most common type of vessel found in these areas.

CHAPTER 10

CONCLUSION

As discussed in Chapter 1, conventional efforts at interpreting Selkirk components have relied on comparisons of artifact assemblages between sites. This is, of course, an essential first step in constructing a regional cultural/chronological framework to which cultural materials from apparently diverse Selkirk components can be compared. I believe the work by Meyer and Russell (1987) has significantly solidified this framework. As a means of enhancing the evaluation of Selkirk components, this study has sought to use ceramic behavioural analysis in combination with intrasite analysis to interpret the archaeological component excavated at Bushfield West. Adoption of this research strategy permitted the Selkirk occupation remains to be interpreted in entirely new ways. It appears possible to obtain more detailed interpretations about past human activities and social behaviours from the remains of Selkirk components, especially if careful consideration is made of the context of each component's remains, and how the artifacts from them were used.

CAVEATS, CAUTIONS, AND A FEW WORDS OF ENCOURAGEMENT

As one reads through the latter part of this work, probably what comes foremost to mind is the unusual amount of social interpretation that has been developed from the primarily archaeological data recovered from the site. However, despite the level of interpretation that was attempted, much of it was made in the absence of detailed examination of more traditionally studied components of the available archaeological assemblage. For example, analysis of stone tools was limited to derivation of simple functional interpretations of individual items recovered from activity complexes. There was little discussion of those activity complexes in terms of tool morphology and attribute variables; indeed, neither were lithic material studies used to compare the complexes. Some of these studies have been undertaken to some extent, and are described elsewhere (Gibson 1994, McKeand 1995, MacLean 1995); others remain to be done. Therefore, it must be acknowledged that many of the assumptions and hypotheses set up in this study represent but the first stage of analysis. Continued in-depth work on debitage and lithic tool problems, as well as faunal studies, hearth content studies and ceramic materials analysis can be used to test these assumptions and hypotheses for many years to come.

The numerous "cautionary" archaeological lessons revealed by many ethnoarchaeological studies (e.g., Janes 1983; Yellen, 1977; Binford, 1978; Kent, 1984; Simms 1988) have tended to discourage rather than encourage archaeological interpretation of activity areas. Archaeologists are continually belaboured with self-evident caveats such as "refuse is not necessarily deposited where an activity took place" or "the artifact assemblage may not reflect the frequency of occurrence of an activity." Taken as gospel truth, these statements can contradict most interpretive methodologies employed by archaeologists. Consequently, it is very common to see fairly conservative analyses of sites (which deserve much more interpretation than simple site description) with an obligatory leap into cultural-historical interpretation and perhaps a bit of socioeconomic analysis thrown in to cap off the study. This unwillingness to deal with actual data is not relieved by the many papers and books that seek to shed light on intrasite analytical procedures. Often as not they tend to be very long on theory but very short on its application. This study is a direct challenge to "cautionary tales" which I believe achieve little other than to stifle innovation and discourage active application of new methods and techniques in archaeological interpretation. It is incumbent upon every archaeologist who excavates a site to wring as much knowledge as he or she can from the archaeological remains. Though they must be prepared to defend their work under scientific challenge, archaeologists must also be encouraged to take their analysis that extra step; to make that new conjecture or develop that new hypothesis based on their observations. Only then can the discipline move beyond simply recovering "redundant" information.

Some archaeologists might be particularly uneasy with the "modal human behaviours" which were developed in Chapter 6. I am quick to admit that this human activity classification is somewhat simplified. Trying to interpret what took place in the past from material remains is a formidable task. Consequently only the most basic of human behaviours were identified. From the perspective of a professional archaeologist and scientist the classifications seem useful. From the perspective of the people who actually left the cultural remains behind, the classifications may make no sense whatsoever. Consultation with the local Native community may have been one appropriate way to address the validity of these behaviours, as has been done in other regions (e.g., Janes 1983). This research would have been a major investigative endeavour in its own right, and was judged to be beyond the scope of this study when it began. Several attempts to test some of the site formation and use hypotheses developed here, with the assistance of First Nations people, have yet to come to fruition because of lack of support funding and political complications. Nevertheless, it is suggested that this study may serve as a useful model for the consideration of the Native viewpoint about hypothetical Cree campsite behaviour, prior to the arrival of Euro-Canadians onto the Saskatchewan River.

Ethnoarchaeological models were important sources of information for deriving many of the interpretations made on Bushfield West. One important observation derived through ethnoarchaeological studies, which was strongly supported by the Bushfield West excavations, was the need to expose large areas of a site in order to carry out a reasonably complete intrasite analysis. Although the areas suggested by O'Connell (1987:105,106) may be appropriate for certain kinds of site analyses, for practical purposes, an activity complex on Bushfield West was adequately exposed with a circle of four to five metres radius. Once an activity complex was discovered, excavation of a 50 or 100 m square block would almost always be large enough to expose the central working areas plus areas of immediate disposal. Most importantly, ceramic crossmends suggested that most pottery vessel remains did not become scattered beyond this area. This size of exposure is slightly smaller than the minimum exposure suggested by others (for example Simms 1988:210) for successful pattern recognition within a campsite. Nevertheless, it appears to be an optimum size for interpreting commensal residence areas in this kind of occupational situation in the boreal forest.

Intra-Site Human Behaviour on Bushfield West

Multiple lines of evidence indicated that the living surface on which Bushfield West was situated could not have been extant for many years, and that human occupation of the river flat took place just prior to the landform surface being once more covered by alluvium. Large scale exposure of the site's discrete occupation revealed a vast quantity of cultural remains. Using a specially devised material clustering analysis methodology, discrete artifact clusters were delineated and recognized as the residue of prehistoric activity. These artifact clusters were individually analyzed in order to interpret the behaviour that created them. Study of the behaviours helped to link the activity areas into composite areas called activity complexes.

Most activity complexes were hypothesized to have been the physical remains of shelters (possibly residences) or outdoor workshops, each yielding faunal remains which indicate that they were formed in the late spring. Although bison and beaver were the most common identified species consumed, lesser numbers of many other species were evidently exploited. Many specimens of upland birds and waterfowl, small and large mammals and fish were also identified. Although faunal interpretations for this study were based on a limited, sampled faunal data set, a subsequent, independent, and very thorough study of most of Bushfield West's faunal remains by Peggy McKeand as part of a Masters thesis did not significantly challenge the interpretations presented in this study (McKeand 1995).

The interpreted activities that took place within each of these shelters and workshops suggested that some were devoted to general domestic tasks usually involving subsistence. A few complexes deduced to be residences yielded evidence of non-domestic behaviour, generally referred to as ceremonial behaviour. Interpretation of the tasks carried out in each area suggested that some residences/workshops were occupied and/or used principally by men, some by women and a few were occupied by representatives of both genders.

Linking Activity Complexes

Although it is beyond the direct focus of this thesis, a few comments can be made concerning the spatial and temporal relationships exhibited between the major excavation areas discussed. Geoarchaeological evidence suggested that the surface of Bushfield West was occupied for very few years prior to its inundation. In fact, evidence suggested that some of the archaeological remains had been buried within one season of their being abandoned. The apparently minimal period of stable surface development coupled with the abrupt discontinuation of an inhabitable surface suggests that only a few seasons of human occupation could have reasonably been possible on Bushfield Flat during that episode of surface stability.

Concomitant with the geomorphological evidence, there was very little archaeological data that could be used to demonstrate that the site had been reoccupied over any length of time. In fact, in most parts of Bushfield West the paleosol was completely sterile. Most indications of human habitation consisted of the presence of distinct artifact clusters, often forming activity complexes that surrounded significant features such as hearths or refuse middens. Even in areas of densest occupation there was no distinct indication of activity overlap. Upon reflection, it seems unusual that the intense activities that produced dense amounts of artifactual debris did not overlap in any significant way. It is therefore argued, given the debris patterning found on Bushfield West, that any re-occupation, if it did occur, must have come on the heels of the previous visitation. This inference would account for the fact that, though activity complexes were situated quite close to one another in some areas (Block 2 for example), they never did coexist on the same part of the living surface.

A detailed comparison of the relationships between activity complexes is beyond the scope of this particular study. This analysis was done as part of the general site reporting, culminating in the final site report (Gibson 1994), now under third-party review. Nevertheless, from the abbreviated data presented in this work, several observations can be made about the spatial and functional relationships between activity complexes.

Most of the complexes that were examined through excavation were located within 10 m of one another. Although large areas of the site were tested magnetometrically, by shovel assessment and by extensive exposure using heavy equipment, nearly all archaeologically productive occupation was localized to the northwest corner of the site. A second area of dense occupation was hypothesized (based upon redeposited artifact recoveries) to have been located along the west side of the site adjacent to the river; it was destroyed by natural erosion. A third area of occupation consisted of a single activity complex located remotely on the interior of the site. The proximity of the activity complexes to one another in their respective localities suggests that they may have been related, and perhaps represent evidence of synchronous occupation. Thus, the activity complexes in Sub-Blocks 2.1, 2.2 and 2.3 were sufficiently close to one another to have represented separate coexisting residences of a single band. Block 1 was also located nearby, and may have been part of this hypothetical synchronic occupation. Block 8 was somewhat more distant, and in fact appeared to bridge the area between the relatively isolated Block 3 and the northwest occupation area. The activity complexes in Blocks 3 and 8 could be expected to represent separate, asynchronous occupations based solely on proxemics.

The abundant faunal assemblage helps in determining relationships amongst activity complexes. Seasonality data from the assemblage suggest that every block and sub-block activity complex was formed during the late spring. This interpretation is based upon the recovery of foetal bison elements, immature beaver remains and varying quantities of egg shell fragments. Block 8 yielded no foetal or immature animal remains, although the small block did produce two pieces of egg shell.

Again, with the exception of Block 8, all excavated areas produced identifiable faunal assemblages heavily dominated by bison and beaver remains. Block 8 was the only activity complex that did not produce identifiable beaver elements. This absence may indicate that the activity complex may have been formed at a different season (the presence of egg shell seems to contradict this interpretation), or at least under differing circumstances.

Faunal assemblages did show some differentiation for some activity complexes, however. Block 1 yielded a considerable quantity of bird remains, as did Sub-Block 2.1. The other adjacent activity complexes in Sub-Blocks 2.2 and 2.3 did not produce as many bird remains. Ordinarily, this difference would be a significant phenomenon, suggesting that the individuals forming the activity complexes were involved in slightly different modes of resource exploitation. However, minimal identification of avian fauna in the latter two Sub-Blocks can most probably be attributed to differences in faunal analysis procedures rather than actual differences in the assemblage compositions. The really significant difference in faunal remains between Block 1 and the other activity complexes rests with the quality of bone recovery. In Block 1, bone was recovered in a relatively unbroken state, in contrast to the faunal remains collected in other areas of the site, particularly in the activity complexes of Block 2. This phenomenon will be discussed in more detail later.

There are a number of other ways in which the activity complexes can be related using the site artifact assemblage. However, for purposes of this study they are not addressed. They are examined in more detail in the final site report (Gibson 1994).

Significant differences become apparent when comparing the activity complexes behaviourally. For example, extensive tool making was interpreted to have occurred in the activity complexes of Sub-Blocks 2.1, 2.3, and Block 3. This industry was also correlated with ceremonial activity in the three complexes. These areas were interpreted to have been primarily used by males. An extensive tool manufacturing industry was largely absent from the activity complexes of Block 1 and Block 8. The primary activities interpreted for those locations were hide working and food preparation, suggesting that they were used by females. Block 2.2 manifested two distinct kinds of activity (tool making and bone rendering), which could not be feasibly undertaken simultaneously. Consequently, two stages of use were hypothesized for the area. In "Stage 1," intensive stone working (and probably other activities as well) was carried out around a hearth. Men were interpreted to have carried out these activities. In "Stage 2," the heating area was expanded by placing a second hearth beside the first and adding a rock pit; intensive bone smashing and boiling was then undertaken. Women were hypothesized to have been the primary participants in this activity.

Using proxemic, faunal and interpreted behavioural data, it is hypothesized that the activity areas of Block 1 and Sub-Blocks 2.1, 2.2 and 2.3 could have represented a synchronous occupation of Bushfield West during the late spring. The limited data suggest that male ceremonial activities took place away from the river, while female activity occurred close to the river edge. Between the two areas was an intermediate zone in which male tool-making activity and female food processing activities could coexist.

Of course, this is a very tentative hypothesis which requires testing using other data. One very important data set that can be used to test these ideas is the ceramic assemblage.

CERAMIC VESSELS AS BEHAVIOURAL INDICATORS ON BUSHFIELD WEST

Bushfield West yielded remains of 96 vessels. Through stylistic comparisons, the assemblage seems most closely related to Clearwater Lake Punctate materials found downriver on the Saskatchewan near the community of The Pas, and on surface sites identified on Clearwater Lake. Meyer (1981) noted that at least a few vessel attributes bore stylistic characteristics resembling Pehonan Complex pots. Using stylistic attributes of the pottery, there was little difficulty in placing the Bushfield West pottery assemblage generally within the existing Meyer-Russell cultural-historical framework.

Probably the most remarkable aspect of the Bushfield West vessels was their homogeneity of form and decoration. As a consequence, the collection was analyzed in a somewhat non-traditional way in order to discern patterns of vessel construction, form and use. Style, the most frequently addressed attribute of Selkirk pottery, was purposefully de-emphasized. Instead, the collection was analysed primarily from the perspective of a tool class, rather than as artifacts bearing information about style. Less commonly examined characteristics such as paste colour and consistency, certain vessel form variables, and the interpreted use to which a vessel had been subjected, were particularly investigated.

Detailed qualitative and quantitative treatment of the collection indicated that significant variation occurred within characteristics which could have been affected through vessel use. Ethnohistorical documentation, tested through replicative experimentation, appeared to corroborate the hypothesis that vessel use could be reliably interpreted through relatively superficial examination of the residue found adhering to a vessel's paste, and in the presence of firing stains on its walls. Using these criteria, four classes of pots were identified in the Bushfield West assemblage: heavy cooking, light cooking, boiling and utility. Further study indicated that pot function appeared to be unassociated with most traditionally examined vessel attributes (particularly style), but could be associated with general vessel form and some manufacturing characteristics.

Vessel function and usage was found to be directly and indirectly responsible for much of the variability within the Bushfield West ceramic assemblage. For example, it was determined that the frequency of vessel use on a fire was probably the primary variable responsible for variation in vessel paste quality and colour. Interpreted vessel use was also found to be a strong factor in "determining" vessel form. Vessels used for cooking tended to have larger rim diameters and longer rims than those used simply for boiling water or other non-staining liquids. In fact, the rims of the latter vessels were found to be among the smallest in diameter and shortest in length within the entire pottery assemblage. Cooking pots also tended to have rims which curved outward, while the rims of boiling pots tended to be vertical. Finally, boiling pots were found to have a thinner, less robust construction than cooking pots.

One class, utility vessels, was found to fall midway between the cooking and boiling vessel classes in form and attributes. These were used to develop the argument that vessels used for cooking and boiling were the two primary types made by potters on Bushfield West. Utility vessels were hypothesized to represent vessels that were not sufficiently well made to be used for cooking or boiling. They may have served as containers for dry or wet storage, and probably were rarely purposefully made. However, some utility vessels may have been specifically made for non-heating purposes. Small cups and bowls, for example, were probably never made for heating on a fire. Some larger vessels may have been specifically made for ceremonial use, as well.

Several hypotheses were developed to account for the variation in form and size for cooking and boiling vessels. It was suggested that the purposefully designed variation may have been attributable to the way in which the pots were used on a fire. Boiling pots were smaller and had shorter rims, which would have made them useful for filling with water and setting directly in a fire. Cooking pots were large in size and more robust in construction, and had rims that were larger and flared outward. This feature would have facilitated their being suspended over a fire, which would maximize heat exchange to the pot contents, permitting a more efficient (and quicker) cooking process. Pots with large quantities of cooking residue adhering to their paste (heavy cooking pots) were hypothesized to have been used for tasks involving long-term cooking of fat-laden food. This food may have been smashed bone, which was boiled in water to remove the fatty marrow.

A number of assumptions about the use of ceramics on the site were made so that the artifact class could be used to help explain human behaviour taking place on the site. The ceramic use assumption is perhaps the most critical one for this study. Basically, it is assumed that vessels encrusted with cooking residue were used for cooking, and that the amount of residue encrusted on a pot can be used to infer the type of cooking for which the vessel was used. Specifically, vessels encrusted with the heaviest cooking residue were hypothesized to have been used at Bushfield West for bone boiling to obtain grease. Archaeological interpretations from other regions support this hypothesis. Unfortunately, there are no ethnohistorical data available in western Canada either to support or refute the idea.

In an attempt to verify the critical ceramic use hypothesis, a series of replication studies addressing the relationships between pot use and food residue formation were initiated. The results of the experiment suggested that repeated rendering of fat in a clay pot containing boiled water would account for the presence of carbon encrustation in precisely the areas found on many of the pots from Bushfield West. Repeated boiling of vegetables and fruit in similar pots did not produce significant carbon encrustation. The experiment was repeated at another location using different vessels, yielding similar results.

To date, this kind of experimentation has not undergone widespread scrutiny and practice for pottery use studies. In fact, pottery use studies are only now being undertaken with any regularity. Consequently, it is argued that there are many specific situations in which pots could be used, and thus specific experiments must be set up to match each situation. Potentially, residue formation experiments could show that the kind of food boiled, the temperature and length of time in which it was heated, or the size and shape of the heating vessel, all contribute to the formation of food residue. Fortunately, one such study has just been completed by Mary Malainey at the University of Manitoba, and includes results of residue analysis of a sample of Bushfield West pottery.

As part of her Ph.D. research, Malainey studied the residue remains from more than 200 cooking pots from 18 plains, parkland and forest sites from western Canada (Malainey et. al. 1997 a,b). Her work focused on analyzing the residues trapped in the walls of pots, using gas chromatography to determine the relative percentage of fatty acids present in individual potsherds. The fatty acid composition results were compared to that of a reference collection of wild plant and animal foods, using principal component analyses. Without direction from the author, Malainey chose 19 samples from the Bushfield West ceramic assemblage. Since her analysis procedures were considered destructive, she collected samples from either well-represented vessels, or from body sherds not associated with any particular vessel. Her analysis results are shown in Table 10.1 (Malainey 1997).

Six identifications were made of fragments of identified vessels (V2,4,14,40,42 and 92) associated with specific activity areas (AA1.3, 2.1, 2.2, 3.7 and 8.2). Three other identifications were made on sherds believed to be part of specific vessels (V5, 29 and again, V92), but direct crossmends could not be made; these also came from specific activity areas (AA8.2) or exploratory Blocks (B5 and B10). One sherd was collected from a specific activity area in which a number of vessels were identified (AA2.37), but it could not be definitively associated with any particular vessel. However, re-examination of Malainey's records (including the photographs and sketches of the sherds she processed) suggests that the fragment is part of the shoulder of Vessel 21, parts of which were also found in Activity Area 2.40. The remainder of the sherds came from uncertain contexts associated with the Reworked Sand deposit.

Malainey's residue source interpretations strongly support the vessel use interpretations summarized in Chapter 9. For example, Vessels 2 and 4, from Block 1.3, were interpreted to have been used to cook large herbivore (presumably bison) and plant remains. This mixed pottery usage correlates well with the interpretation that the area reflected general commensal household activities. Vessel 40 yielded residues of large

Lab ID	Vessel	Cat Num	South	East	Block	A.A.	Residue Source
Bush1	4	9760			B1	1.3	large herbivore
Bush2		26953			RS?		large herbivore
Bush3	92				B8	8.2	large herbivore
Bush4	14				B3	3.7	large herbivore and plant
Bush5	2				B1	1.3	plant and large herbivore
Bush6	42				B2.2	2.1, 2.2	plant and large herbivore
Bush7	40				B2.2	2.2	large herbivore
Bush8		19642	210	106	RS		plant
Bush9	V29?	42030	198.5	57	B10		large herbivore
Bush10		20455	216	112	RS		fish or corn
Bush11		20391	214	112	RS		large herbivore and plant
Bush12		23671	210	124	RS		large herbivore and plant
Bush13	92?	42772	221	74.5	B8	8.2	large herbivore
Bush14		19694	212	106	RS		large herbivore
Bush15	V5?	35716	331	78	B5		fish or corn and plant
Bush16		32818	182	70	B2.3	2.37	plant
Bush17		23977	223	117	RS		fish or corn
Bush18		21646	214	116	RS		large herbivore with plant
Bush19		24025	225	118	RS		large herbivore and plant

Table 10.1. Summary of pottery samples used and interpreted sources of residues from Bushfield West ceramic assemblage (from Malainey 1997).

herbivore, and was associated with Activity Area 2.2, interpreted to have been the location where intensive bone marrow processing took place, among other activities. Vessel 42, containing plant and large herbivore residues, was associated with this activity area, although most of its pieces came from Activity Area 2.1, where it appeared to have been purposefully dumped. Since Sub-Block 2.2 appears to have been a multi-use locality, it is possible that Vessel 42 may have been used when the area was a commensal residence (hence the mixed residue results) and that Vessel 40 was used when the area was a bone processing locality.

Block 8, interpreted to have been a domestic residence in which hide working and meal preparation dominated, was represented by Vessel 92, a heavy cooking pot yielding large herbivore fat residues. The one vessel representing Block 3 (Vessel 14) was suspected of being intrusive and cannot be considered unequivocally to represent the activities interpreted for that locality.

Undoubtedly the most intriguing residue interpretation is associated with sample "Bush16" (Table 10.1), which is unequivocally identified with plant remains. The sample potsherd was recovered from Activity Area 2.37, in which it has been associated with Vessel 21. This vessel, based on paste characteristics, was interpreted to have been used for boiling clear liquids. Sub-Block 2.3 was interpreted to have been a men's special purpose residence, where ceremonial activity dominated, and pot use was restricted to boiling liquids for beverages and for mixing ochre. Consequently, the identification of plant residues from this pottery sample correlates well with the interpretation that the vessel may have been used to prepare a hot plant-based beverage.

ASSESSING THE CHARACTER OF ACTIVITY COMPLEXES THROUGH ANALYSIS OF CERAMIC BEHAVIOUR

Integration of the ceramic stylistic and behavioural data did not alter the synchronic/asynchronic relationships derived from the non-ceramic data set. In fact, they tended to establish the relational hypotheses more firmly. For example, the activity complex in Sub-Block 2.3, though containing a number of identifiable vessels, yielded no cooking pots whatsoever. This anomalous finding considerably strengthened the interpretation of that area as being one where very special activities took place, with men being the principal, if not sole, participants. The evidence for any female-associated activities within the complex was not very strong, except in one small area. If women were present in the activity complex at all, they apparently did not have a significant presence which could be related to the deposit of non-perishable archaeological remains.

In the case of Block 8, pottery remains helped in the understanding of the complex's relationship to other areas of the site. In this case, the activity complex could not be conclusively linked to any other complex because it was spatially separated from the others, and yielded an anomalous faunal assemblage. The ceramic assemblage (which for interpretive purposes consisted of only one vessel) appears to support the unique nature of its occupation by being in itself stylistically distinct from the other complexes, in mode of vessel construction, surface finish and form. The evidence, independently derived through ceramic and other data sources, indicates that this locality of Bushfield West may have been occupied at a time other than when areas several score metres to the north were inhabited. By contrast, the ceramics from Block 3, located even farther away in what may have been a heavily forested part of the site, did not significantly differ in style or use behaviour from those of most of the other activity complexes on the site. Since Block 3's non-ceramic characteristics were also quite similar, it seems reasonable to conclude that the locality, despite being remote from the rest of the occupied site, may have been conterminously inhabited.

Significant ceramic links were found between activity complexes of Block 1 and Block 2. The really important area that served to tie the Block 1 and 2 complexes together was located in Sub-Block 2.2. This activity area was interpreted to have been a bone smashing and marrow rendering (loosely termed "bone boiling") location. The ceramic assemblage from the complex, consisting of a large number of heavy cooking pots, supported the bone boiling interpretation. The non-homogeneous mixture of vessels suggested that personnel from at least two of the activity complexes may have taken part in the rendering activity: a boiling pot and a utility pot from Sub-Block 2.2 clearly resembled a cooking vessel recovered from the domestic residence of Block 1; and a boiling vessel and a cooking vessel from the same area bore strong resemblances to a boiling vessel from Sub-Block 2.3. Sub-Block 2.1 produced no vessels which were sufficiently distinct in style or form to enable the forging of a direct ceramic association with Sub-Block 2.2. However, the former block did produce a large number of heavy cooking vessels which could not be correlated with extensive bone smashing activities. It is possible that those pots could have been used in the hypothetical bone rendering operation of Sub-Block 2.2.

There is at least one modification which can be made in the interpretation of activity complexes when ceramic behaviour data are considered. This concerns the assigning of certain personnel to an activity complex. In Sub-Block 2.1, the presence of cooking pots in high frequencies suggests that women may in fact have been more active within the activity complex than other archaeological data indicate. Whether these women were actually using the pots, and not the men who appear to have been responsible for most of the artifact debris, is difficult to determine, although in other areas of Bushfield West it would appear that men did not have an affinity for cooking vessels.

Application of Behavioural Ceramic Theory to Other Selkirk Occupations

There appeared to be surprising congruity between hypothesized pot function and the interpreted human behaviour which took place on selected areas of Bushfield West. However, can the simple guidelines for interpreting pottery use in terms of site behaviour be applied to sites which do not have as complete an archaeological record as exhibited on Bushfield West? Is it possible to use the functional categories derived from Bushfield West's *in situ* occupation to interpret archaeological sites which consist solely of sherd collections with inaccurate locations? The substantial ceramic collection recovered from the Reworked Sand deposit provided an opportunity to test the predictive utility of the ceramic hypotheses.

The remains of 24 recognizable ceramic vessels were recovered from the Reworked Sand deposit. Nearly all were single rim sherds and all were from uncertain contexts. Ordinarily, when compared with the much more complete recoveries made from the excavated activity complexes, it would have been expected that these sherds would yield little behavioural information about the site. However, using the critical attribute and metric criteria derived and applied to the defined activity complexes, even small rim sections yielded significant information about the vessels. Statistical testing of the sample variables suggested that the Reworked Sand vessels were part of the Bushfield West target population. Subjective comparisons of the Reworked Sand materials with the excavated materials supported this observation. Although most of the rims were fragmentary, most did not appear to be much different in form and decoration from pot remains in any of the activity complexes.

Since the Reworked Sand ceramics appeared to be very similar to those from the excavated areas (both objectively and subjectively), it was considered feasible to take this large sample of vessels and, using the results of the ceramic behavioural interpretations developed for the *in situ* excavations, produce generalized models of behaviour which could be used to interpret the kinds of activities which produced the sample pots.

For example, eight of the 12 cooking pots identified from the Reworked Sand deposit were heavily encrusted with cooking residue. It was hypothesized that pots bearing such stains were used for boiling bone fragments in order to obtain their marrow. A correlation was made between the coexisting presence of large numbers of heavy cooking pots and widespread evidence of bone smashing activities. Therefore, it could be predicted, in view of these data, that bone smashing and marrow rendering were also important activities which took place in the areas represented by the Reworked Sand.

Unfortunately, the fragile nature of this kind of predictive argument becomes all too obvious when reviewing the actual situation exhibited at several of the activity complexes on Bushfield West. For example, heavy cooking pots were found on other parts of the site (albeit in lesser frequencies) where bone marrow extraction did not appear to be a major activity. Consequently, no direct correspondence can be incontrovertibly predicted. In addition, the identification of four light cooking vessels, four boiling pots and eight utility pots in the Reworked Sand assemblage made it difficult to deduce what particular type of activity took place in the source area of the redeposited sands. Without additional kinds of data, such as the presence of smashed bone or hearth remains, one can rely only on proportional statistical quantification to hypothesize types of activity in an area. Given the chances that many other kinds of behaviour may have yielded similar vessel counts (the sands may have represented the remains of six or seven separate activity complexes, for example), generalized statements based on proportional frequencies should be used with caution to interpret the data.

The ambiguity of the morphological data aside, examination of Malainey's residue data (Table 10.1) with reference to the Reworked Sand pottery indicates that samples from this assemblage were used for different cooking purposes than those of the *in situ* pottery assemblage. In addressing this issue, consideration of vessel provenience on the site becomes an issue. The *in situ* sample recoveries come from all over Bushfield West, but the out-of-context Reworked Sand samples are hypothesized to have derived from a spatially segregated locality located south and west of the main block excavations. Detailed shovel test assessment and post-excavation topsoil stripping over the entire site demonstrated that there was a definite break in artifact recoveries between the north end of the site, where the main block excavations took place, and the south side, in which very little evidence of occupation was observed, except for isolated Blocks 5 and 17, even in areas where the occupation paleosol was not eroded. Therefore, it is acceptable to hypothesize that a separate encampment was located in the southwest portion of Bushfield West. The main part of the archaeological remains of this south encampment were eroded away by flooding, leaving only a few remnants such as the finds from two abovementioned excavation blocks, and of course the artifacts found in the Reworked Sand.

The hypothesized spatial extent of the two camps is shown in Figure 10.1.

If the South Encampment is to be considered a separate occupation locality, then it is reasonable to reassign some of the vessels from Table 10.1 to the newly defined camp. For example, Vessel 14 (Lab ID Bush4, Table 10.1) has elsewhere been consigned to the Reworked Sand deposit. As well, sample Bush15 from Table 10.1, provisionally assigned to Vessel 5, represents an actual *in situ* recovery within the hypothesized extent of the South Encampment. Table 10.2 shows the consequence of this sherd sample reassignment.

The implications of the Table 10.2 data are significant. In the North Encampment, five pots yielded large herbivore residues, two exhibited traces of large herbivore and plant residues, and one had traces of plant residues. For the South Encampment, only two samples yielded residue traces consistent with those of large herbivores alone and another four were associated with herbivores and plants. Three samples produced residues which suggested they were derived from either fish or corn remains. Although current calibration statistics are unable to distinguish the two lipid sources reliably (Malainey et al. 1997), I strongly suspect that the actual source is probably fish.

Site Locality	Herbivore	Herbivore/Plant	Plant	Fish/Corn
North Encampment	5	2	1	0
South Encampment	2	5	1	3

Table 10.2. Assignment of pottery residue sherd identifications by hypothesized Encampment on Bushfield West (data from Table 10.1).

Of course, the sample data are meagre; it would be especially interesting to expand the residue analysis to sample all identified vessels from Bushfield West and obtain a fuller understanding of what was cooked in them. However, sample limitations aside, it is apparent that although the pottery assemblages from the two separate encampments exhibit similar morphological and decorative characteristics, they appear to have been used for cooking different kinds of food. In the North Encampment, bison parts were the dominant remains in the faunal assemblage; fish remains were relatively poorly represented. This difference appears to be reflected in the high proportion of residue samples associated with large herbivores. In the South Encampment, where there are no significant *in situ* remains to study, residue data indicate that although large herbivores were consumed, fish was also an important dietary source. Therefore it is hypothesized that the encampments were not asynchronous; however, it is still argued that the encampments were the product of the same group of people, probably revisiting the site in consecutive years. Furthermore, the South Encampment represented the final occupation of Bushfield West by this hypothetical group, since the catastrophic flood which tore up the *in situ* remains rendered the flat uninhabitable, as explained in Chapter 3.

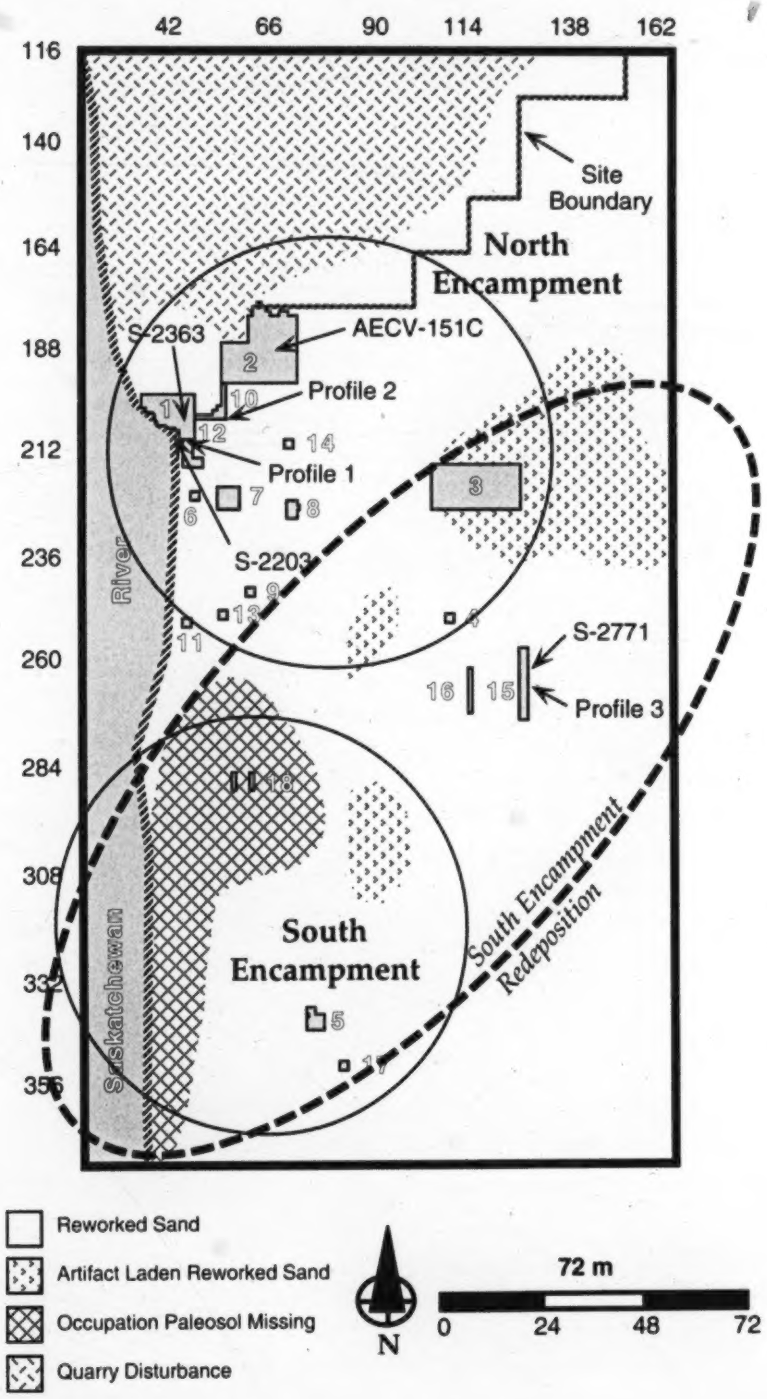


Figure 10.1. Plan view of Bushfield West site, showing hypothetical location of North and South Encampment. Adapted from Figure 3.4.

THE NATURE OF THE COMMUNITY AT BUSHFIELD WEST

Certain aspects of the intrasite analysis and associated ceramic interpretation permit some ideas to be formulated about the group of people who actually were responsible for the remains left on Bushfield West. For various reasons, as discussed above, it has been suggested that the four activity complexes represented in Blocks 1 and 2, as well as perhaps one activity complex in Block 3, may have represented part of one synchronous site occupation, called the North Encampment. Although it could be argued that much of the evidence could be explained by coincidence and insufficient sampling, arguments of proximity, seasonality, subsistence similarities, deduced behavioural similarities and subjective ceramic co-associations have been used to link the areas together, suggesting that they were the remains of a past social system. This hypothetical arrangement of residences can theoretically be used to reconstruct the social organization of the pre-EuroCanadian contact campsite. Since the South Encampment has no appreciable *in situ* remains, it falls outside of the scope of this discussion.

There are many social questions that can be addressed by close scrutiny of the four or five North Encampment activity complexes so delineated. Each complex is distinct and in some way appears to serve as an important component of a larger whole represented by the camp. Thus, within these four centrally located areas and the remote one are a male/female (commensal) residence, a female workshop area, a communal bone rendering area and two male ceremonial residences. The configuration does not appear to represent a typical "hunting group" as described for northern Algonquians elsewhere (Rogers 1969) and seems more complex than would be expected for a local band camp.

In her study of the Northeastern Athapaskans, Helm (1965, 1966) recognized four fundamental groups, based upon group duration and mode of membership attainment. Ranged on a continuum, these were the task group, the local band, the regional band and the "tribe." The task group typically lasted only a short time (a few weeks) and existed primarily for the organization of exploitive activities such as hunting or fishing (Helm 1965:378, 379). The local band consisted of a longer term kin-oriented localized residence unit, somewhat fluid in composition, which could have crystallized out of a particular task group. The regional band grouping was not based upon short or long-term subsistence as was the task group or local band. It was territorial in nature:

> ...the shared orientation of the regional band *in toto* is to an extensive exploitative zone or territory-its biotal resources, their sites, and the routes of access (mainly waterways) to those sites, which determine the stations and movements of various groupings. Traditionally, from the patterns of human ecology that the region imposed on the Indians exploiting it, the region and the people were socially defined. (Helm 1965:376-377)

It is the characteristics of Helm's "regional band" that appear to reflect most closely the settlement situation exhibited at Bushfield West. Though based on studies of Athapaskans, similar social groupings have been identified for Algonquians, including the Cree, by other researchers (Leacock 1969; Rogers 1969). The regional band would achieve its archaeological expression, following Helm's and others' ideas, when local bands and scattered family groups within that region seasonally coalesced. This meeting was a prerequisite in order to ensure a minimally sufficient pool of potential marriage partners and to reaffirm regional band identities and allegiances (Helm 1965:379). It also functioned as a vital source of information exchange about resource conditions in the larger band territory. The archaeological remains exposed on Bushfield West appear to reflect many of these activities, which would represent a spring aggregation of bands separated throughout the winter.

In a recent publication Meyer and Thistle (1995) discuss in some detail the archaeological criteria necessary for identifying the remains of a regional band aggregation site. Borrowing from the work of Conkey (1980) they suggest that such sites would be characterized by a wide range of artifacts found over an unusually large area, with a wide range of archaeological features being present. Despite the diversity in archaeological remains, artifacts bearing identifiable stylistic attributes would be relatively uniform in decorative pattern (Conkey:409-410). The description of the hypothetical archaeological component is very characteristic of the one actually exposed on Bushfield West. Most intriguing, however, is the suggestion that artifactual style would also be uniform; if style reflects the identity of a cohesive social group, it should not exhibit much variability. As has been previously pointed out in several chapters (and is visually evident in Appendix C), the decorative variability of the pottery from Bushfield West is exceptionally uniform. In fact, stylistic variability is so minimal that individual vessels cannot be divided statistically into meaningful groups for detailed analysis. It is therefore argued that the Bushfield West occupation most probably represents a regional band aggregation.

The reason for aggregation on Bushfield Flat may have been the abundance of waterfowl, upland game birds, beaver and fish occurring in a locality during the early or middle part of the spring. It is also possible that a small bison herd may have been grazing on the flat, or the uplands above, permitting easy predation by a large group of people. Whatever the case, this would have been at a time of the year when band members, who had endured a considerable time apart because of winter group dispersal, would take the opportunity to find a place in which all could get together for various social needs. The camp remains exhibited in the North Encampment reflect Meyer's aggregation centre predictions (1982:240-241), and the interpreted behaviours appear to be consistent with those associated with the Goose Dance. Meyer and Thistle (1995) have already exhaustively documented the examples of several aggregation or "rendezvous" localities, and Bushfield West is in fact located on one of the more prominent centres, called "Nipowiwinihk" (ibid: 416; 433).

As tantalizing as it is to set about reconstructing the prehistoric aggregation campsite community using currently interpretable data, it is perhaps premature to carry the interpretation too far. For one thing, the founding assumptions regarding human behaviour versus material remains models must be made more rigourous. Another reason is that there are more data which can be used to help fill in the relationships between the areas. These include tool and lithic analyses, ceramic materials studies, ceramic residue analyses, hearth content comparisons, enhanced faunal analyses, microfaunal analyses and fingerprint studies, to mention only the major ones. A considerable quantity of primary data from the site resides in archival storage at this time, awaiting any number of analytical treatments which can be used to build on the hypotheses generated in this study, or to investigate different problems. For example, if the Reworked Sand artifact assemblage is the product of an entirely separate encampment of the same group of people, what artifact analysis methodologies can be brought to bear on the collection to try and replicate the findings from the *in situ* recoveries from the North Encampment? Perhaps even more important, can the results of this particular Bushfield West study be used to direct research questions on other sites in the region which yet remain to be discovered? Can remains of the group who camped on Bushfield Flat be identified elsewhere along the Saskatchewan River valley, or its tributaries?

With this question in particular, I believe it is time to draw back from the communal dynamic represented in the activity complexes and ponder instead the implications of the synchronous Selkirk occupation represented by the North Encampment and (perhaps) the South Encampment, what they represent in terms of human social organization and how the ceramic artifact assemblage so important to Selkirk archaeological interpretation is reflected in this social situation.

The Bushfield West Community and the Selkirk Composite

Assuming Bushfield West represents an archaeological manifestation of the regional band, the ceramic variability exhibited by the component should be roughly reflective of the band community. This appears to be the case, for, as demonstrated by objective and subjective analysis, the ceramic assemblage from Bushfield West appears to be internally homogeneous, and yet unique in comparison to other Selkirk ceramic assemblages. The conservative, repetitive decorative styles used on almost all pots (cord-wrapped-stick on rim lip, single row of punctates below lip, fabric finish on body, rounded but sometimes prominent vessel shoulders, straight, long rims) suggest a profound group identity reflected, or perhaps purposefully focused upon, pottery. This "identity-imprint" appeared to crosscut pot function, and was even found on the smallest vessels, interpreted to have been "toy pots" manufactured for or perhaps by young, aspiring pottery makers. The most significant variations that appeared between pots were subtle changes of vessel form, principally represented by a few pots which exhibited unusually prominent incipient-S rim shapes. Yet these pots still seemed to adhere to the overall "Bushfield" style of high, straight decorated rims and single rows of punctates.

As will be explained below, the Bushfield West assemblage, interpreted to be representative of a regional band, appears to be distinct from the ceramics representative of Clearwater Lake Complex sites, Kissis Complex sites and Kame Hills Complex sites. Thus the results of this study, which represents an *in situ* analysis of the variability reflected in a single Selkirk Complex/Regional Band, appears to allay the concerns that Selkirk scholars may have confused intragroup vessel variability with inter-group variability. Theoretically at least, these divisions still stand up since intragroup ceramic variability, at least as reflected by the complex/regional band occupying Bushfield West, is much smaller than the variability between interpreted complexes/regional bands.

Perhaps what is most interesting about Bushfield West is that it is located in a geographic area where another distinctive Selkirk complex, Pehonan, was originally defined. Although the temporal associations of the Bushfield West component and Pehonan components are difficult to ascertain, the site and complex dates appear to be somewhat contemporaneous, the resource exploitation patterns appear very similar, and non-ceramic tool assemblages are identical. Indeed, Pehonan Complex sites are represented in the very flat on which Bushfield West is situated, and the ceramics from Bushfield West have until recently been interpreted as being part of Pehonan (Meyer 1981; Meyer and Russell 1987; Quigg 1983 to name but a few writers).

Vessel	Block	'S' Rim Profile	Nipawin Horizontal	Angular Shoulder	Interior Punctate	Other	Comment
North Encampment							
4	1	•					
21	2.3			•			
39	2.2	•					
40	2.2	•					
41	2.2			•			
48	1				•		Same as V66?
66	1				•		Same as V48?
South Encampment							
7	17			•			
14	3/RS?	•					Probably Reworked Sand
16	RS					•	Zig-Zag body decoration
73	RS	•					
74	RS	•					
76	RS	•					
80	RS	•					
82	RS	•					
87	RS	•					
24	No Context	•					
49	No Context		•				
54	No Context	•					

Table 10.3. Summary of vessels which exhibit Pehonan ceramic characteristics from Bushfield West.

It is true that the hallmark elements of Pehonan pottery are present in the Bushfield ceramic complex, although in minimal frequencies (Table 10.3). The François Punctate type, characterized by decorated or very angular shoulders, is represented clearly by only three vessels (Vessels 7, 21 and 41 have angular shoulders). None of the identified vessels from Bushfield West display shoulder decoration, although at least one decorated shoulder was found out-of-context in the plough zone. The Nipawin Horizontal type, originally thought to be integral to Pehonan but later re-evaluated as a less important marker (Meyer 1984; Meyer and Russell 1987) appears to be represented by only one vessel, 49, which was found out of context. Exterior rim bossing (interior punctating) is probably present on only one vessel, (Vessels 48 and 66 may be one and the same). Similarly, "S" rim profiles (most being very slight) appear in less than 15% of the vessel assemblage. In summary, only six vessels have any attributable Pehonan characteristics from the North Encampment area, while nine are attributable to the hypothesized South Encampment.

So what of the ceramic manifestation represented at Bushfield West? Is it part of Pehonan as suggested by others, or is it sufficiently distinct to define another Selkirk Complex? Based upon extensive observation of most significant Selkirk collections it is my hypothesis that Bushfield West is part of a unique Selkirk complex which extends along the Saskatchewan River east to The Pas, and possibly northward into the Sturgeonweir River system. It should be cautioned that this hypothesis is based on observation of surface collections of pottery recovered from sites from the latter region, and more direct observation from pottery recovered from upper components of the The Pas site, housed at museums in Dauphin and Winnipeg. This pottery from the Saskatchewan River appears to be similar to pottery from the Clearwater Lake sites, and to pottery from the Pehonan sites as well, although it actually exhibits few of the genuine Pehonan ceramic attributes in any significant frequency.

It is possible that the Bushfield West assemblage can be considered a subset of Pehonan. Since it is hypothesized that the assemblage was produced by a single group of largely related people over a very short time, it could be argued that the Bushfield West assemblage represents a "snapshot" of Pehonan, as opposed to the longer term observation of the material culture variability which we have defined as Pehonan. Thus, taken over time, one would expect Pehonan to exhibit considerable variability in ceramic attributes (pottery being such a plastic medium as opposed to other non-perishable diagnostic artifact classes) brought on by the variability naturally appearing between generations of pottery makers. The problem is that other Pehonan sites, although not as large as Bushfield West, appear to represent short-term occupations which have yielded pottery assemblages much more variable than this site, containing proportionately many more vessels identified as being Pehonan. For example, the Lloyd site, located less than 2 km from Bushfield West on an adjacent flat, yielded 10 vessels, of which the majority were of the François Punctate style (Quigg 1983:147).

This unique complex is called "Keskatchewan", which is a derivative of the Cree term for "Saskatchewan River" (see Russell 1991:121). The "Keskatchewan" Complex is one of the most clearly defined within the Selkirk Composite. It is representative of a defined group of people as manifested by an extensive, well preserved and definitive archaeological component laid down at a time when virtually all members of the community were hypothesized to be together in one place at one time. The ceramics are homogeneous in style and form, distinct from other Selkirk wares, and appear to be distributed along a logical geographic corridor, defined primarily by the Saskatchewan River.

Keskatchewan vessels are generally well-made, exhibiting a dense, hard paste that could form relatively thin vessel profiles. The vessels exhibit generally long vertical to slightly outflaring rims, which impart a distinctive "collared" appearance. Vessel shoulders range from rounded to abrupt, but are rarely angular. Decoration is usually conservative, consisting of a single row of well-formed punctates set well below the rim edge with frequent exterior rim notching using a cord-wrapped stick. Other kinds of rim decoration occur infrequently, and are usually restricted to the upper rim area, particularly the lip. Interior lip notching is rare; exterior bossing is rare to non-existent, as is shoulder decoration.

The Keskatchewan Complex is the material culture derivative of a distinctive regional band, whose apparent area of resource extraction (at least in spring and summer) was focused on the margins of large river flats on the Saskatchewan River east into the Saskatchewan Delta and north along connecting river systems. Being essentially Selkirk people (i.e., precontact Cree) they shared many material culture similarities with other contemporaneous Selkirk bands. Of their non-perishable cultural attributes, only their ceramics were sufficiently distinctive to separate them from bands in the lower Saskatchewan River area, in the Southern Indian Lake area and even in the Buffalo Narrows area.

In their review of protohistoric Cree rendezvous centres, Meyer and Thistle (1995:416; 433) identify six named aggregating centres in the Saskatchewan River valley, and an additional one off the main river channel. The Pehonan centre is the most westerly, in the Fort A La Corne area. Being the first place up the Saskatchewan River where aspen parkland is contacted, it would have been a logical place for bison hunters and woodland people to meet, as observed by Meyer and Thistle. Eighty kilometres downstream was Nipowiwinihk, where Keskatchewan people met. Using the model put forward by Meyer and Thistle, a third rendezvous centre was located 100 km further downstream at Paskwatinow, and a fourth at Opaskweyaw, near the town of The Pas. Theoretically, Paskwatinow would have marked the meeting centre for a third identifiable group of people, and Opaskweyaw the fourth, making the hypothetical downriver range of the Keskatchewan band from Nipawin to The Pas unrealistically large. However, although tentatively located by Meyer et al. (1992), the actual archaeological component at Pasquatinow is virtually unknown. In fact there have been no ceramic recoveries made at the site, which has yet to receive even cursory archaeological reconnaissance. As previously discussed, the pottery from the The Pas Site examined by the author does bear a striking resemblance to that of Bushfield West, suggesting a strong affiliation.

One fact that must not be overlooked is that the Bushfield West component appears to be temporally defined very tightly. Indeed, there is strong evidence that most of the excavated activity complexes were synchronous, and were the product of a single season of occupation, although other parts of the site (the hypothetical South Encampment) may have been occupied a year or so later. The site may have been occupied only for a few years, perhaps much less than a decade. When one is dealing with a highly mobile society, it may be reasonable to presume that in the space of a generation several aggregation centres might be recognized for a single regional band, and that they might be some distance apart, perhaps as far apart as Nipawiwin and Pasquatinow, or even Nipawiwinihk and Opaskweyaw.

The Meyer and Thistle model of Cree social geography, though drawn with a broad chronological brush, does appear to be a sustainable one when the Bushfield West data are brought to bear on it. Nevertheless, until more work is done in identifying and testing archaeological sites elsewhere along the Saskatchewan River, particularly at Pasquatinow, the actual extent of the hypothetical Keskatchewan regional band remains subject to interpretation.

Meyer and Russell (1987:26) have hypothesized a correspondence between Selkirk ceramic differentiation and precontact Cree sociopolitical differentiation. Specifically, they postulate that the Kisis Complex correlates with the Athabasca Cree of northwestern Saskatchewan, the Clearwater Lake Complex with the Missinipi Cree along the Churchill River and the Pehonan Complex with the Pegogamow Cree from the Saskatchewan River. Where does the Keskatchewan Complex fit in to this scheme? Temporal association of the two complexes is problematic, due to the lack of precise chronological control for Pehonan, and to a certain extent for Keskatchewan as well; nevertheless, there are several possibilities. One is that Keskatchewan and Pehonan were largely contemporaneous clan groups within the precontact Pegogamow; the former preferring to exploit the more forested resources down the Saskatchewan River and into the Sturgeon-Weir systems, and the latter preferring up-river, parkland seasonal exploitation. This would explain the generally similar ceramic assemblages, with Pehonan pottery coming under more influence from possible contacts with Plains-oriented groups to the west and south. Another explanation may be that Keskatchewan is ancestral to Pehonan, and represents earlier, westward occupation of the Saskatchewan River by Selkirk people. This would explain the relative lack of Pehonan traits, which would develop as Keskatchewan people continued to exploit the river valley westward onto the parkland. This can be explained by comparing the Lloyd Site and Bushfield West site ceramic assemblages. Keskatchewan pottery, recovered from a site with good stratigraphic control (Bushfield West), has vessels which are conservatively decorated and relatively homogeneous. Pehonan pottery, represented by another well-controlled site (Lloyd Site), has pottery that is more heterogeneous in decoration with a wider range of pottery types. It is possible that the time of occupation for the Lloyd Site was later than for Bushfield West (whose landform was rendered uninhabitable immediately after occupation) and the wider decorative range was a function of more contact with non-Cree groups to the west and south.

Clearly, more precise chronological control is needed to sort out the relationships between Pehonan and Keskatchewan; discovery and excavation of additional sites representing this time period is strongly recommended.

To summarize, Keskatchewan pottery was very similar to that of a plains-oriented Selkirk band, whose members apparently frequented parts of the Saskatchewan valley where it contacted the open parkland. They could be materially recognized by their pottery style and form, the hallmark of a band which probably congregated at a place called Pehonan. It is even conjectural that the Pehonan band may have had its genesis in Keskatchewan, when a few families chose to leave the Keskatchewan band, centring at Nipowiwinihk, because they wished to exploit parkland resources south of the Saskatchewan River. Lacking sufficient personnel to maintain marriage exchange within the new band, these families may have been compelled to accept people from non-Cree bands also living in the parklands. These new band members were more than likely women, who brought with them their distinctive ideas on how to make and decorate pottery (for a discussion of such a social mechanism, see Hanna 1984). One can only speculate on the pressures that were placed on these immigrant members to conform to the ways of the band, especially in the manufacture of pottery. Nevertheless, it is probable that they succeeded in introducing their own distinctive parkland and plains decorative styles on pottery with a Selkirk form, resulting in the distinctive François Punctate (and to a lesser extent Nipawin Horizontal) form.

Pehonan and Keskatchewan bands may have enjoyed some contact (assuming that they coexisted temporally), but if so it was never a close intermixing, as suggested by the minimal Pehonan pottery recoveries from Bushfield West. If there was ever any significant exchange, it was probably for exotic goods such as obsidian, Knife River flint and the like. Sometimes, of course, something truly foreign, like dentalium, was traded. And occasionally, a piece of iron, something the like of which had never been seen before, was passed on to the Keskatchewan people; a foreboding of impending change as momentous as their recent move from beyond the eastern forest out onto the edge of the plains.

Photo: Diorama from Manitoba Museum of Man and Nature

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Appendix A

Summary Quantification of Artifact Recoveries by Selected Blocks and Activity Areas on Bushfield West (FhNa-10)

B 1

A Area	*AA 1.3*	*AA 1.4*	*AA 1.5*
Ceramics	499	53	34
Tools	21	4	2
Cores	27	6	1
Debitage	1480	311	117
Microdeb	123	0	0
FCR	2066	41	0 (gr)
Faunal	5730	873	0 (gr)

AA 1.3

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	125.3	499	4	23.5
Tools	9.1	21	2.3	13.6
Cores	8.05	27	3.4	19.8
Debitage	474.6	1480	3.1	18.4
Microdeb	1972.95	123	0.1	0.4
FCR	3092.6	2066	0.7	3.9
Faunal	1669.85	5730	3.4	20.3

Cells	35
CCs	2.42

AA 1.4

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	32.22	53	1.6	15.1
Tools	2.34	4	1.7	15.7
Cores	2.07	6	2.9	26.6
Debitage	122.04	311	2.5	23.4
Microdeb	507.33			
FCR	795.24	41	0.1	0.5
Faunal	429.39	873	2	18.7

Cells	9
CCs	1.56

AA 1.5

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	7.16	34	4.7	31.5
Tools	0.52	2	3.8	25.5
Cores	0.46	1	2.2	14.4
Debitage	27.12	117	4.3	28.6
Microdeb	112.74	0	0	0
FCR	176.72	0	0	0
Faunal	95.42	0	0	0

Cells	2
CCs	2.15

B 2.1

A Area	*AA 2.27*	*AA 2.42*	*AA 2.43*
Ceramics	0	24	2980
Cores	0	9	147
Tools	3	5	106
Debitage	21	213	10100
Microdeb	0	634	73065
FCR	0	2951	8677 (gr)
Faunal	54	797	8761 (gr)

AA 2.27

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	3.58	0	0	0
Tools	0.26	3	11.5	81
Cores	0.23	0	0	0
Debitage	13.56	21	1.5	11
Microdeb	56.37	0	0	0
FCR	88.36	0	0	0
Faunal	47.71	54	1.1	8

Cells	1
CCs	2.01

AA 2.42

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	35.8	24	0.7	4.7
Tools	2.6	5	1.9	13.5
Cores	2.3	9	3.9	27.5
Debitage	135.6	213	1.6	11.1
Microdeb	563.7	634	1.1	7.9
FCR	883.6	2951	3.3	23.5
Faunal	477.1	797	1.8	11.8

Cells	10
CCs	2.04

AA 2.43

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	322.2	2980	9.2	19.8
Tools	23.4	106	4.5	9.7
Cores	20.7	147	7.1	15.2
Debitage	1220.4	10100	8.3	17.7
Microdeb	5073.3	73065	14.4	30.8
FCR	7952.4	8677	1.1	2.3
Faunal	4293.9	8761	2	4.4

Cells	90
CCs	6.66

B 2.2

Ac Area	*A 2.1*	*A 2.2*	*A 2.3*	*A 2.4*	*A 2.5*	*A 2.6*	*A 2.7*	*A 2.8*	*A 2.9*	*A 2.10*	*A 2.11*
Ceramics	176	988	5	26	101	181	5	50	168	21	1
Cores	9	47	2	5	5	10	3	9	14	1	2
Tools	3	13	4	3	20	4	4	4	14	3	0
Debitage	266	1686	93	118	411	203	34	235	433	41	47
Microdeb	1226	9202	705	282	1951	625	38	489	759	37	77
FCR	296	11434	187	1571	1583	89	1308	266	2751	908	1111 (gr)
Faunal	1552	5761	295	1359	3447	2232	3009	3159	4027	290	1358 (gr)

AA 2.1

Class	Expect	Actual	C	% C
Ceramics	42.96	176	4.1	28.2
Tools	3.12	9	2.9	19.9
Cores	2.76	3	1.1	7.5
Debitage	162.72	266	1.6	11.3
Microdeb	676.44	1226	1.8	12.5
FCR	1060.32	296	0.3	1.9
Faunal	572.52	1552	2.7	18.7

Cells	12
CCs	2.07

AA 2.2

Class	Expect	Actual	C	% C
Ceramics	175.42	988	5.6	26.3
Tools	12.74	47	3.7	17.2
Cores	11.27	13	1.2	5.4
Debitage	664.44	1686	2.5	11.8
Microdeb	2762.13	9202	3.3	15.5
FCR	4329.64	11434	2.6	12.3
Faunal	2337.79	5761	2.5	11.5

Cells	49
CCs	3.06

AA 2.3

Class	Expect	Actual	C	% C
Ceramics	14.32	5	0.3	2.6
Tools	1.04	2	1.9	14.2
Cores	0.92	4	4.3	32.1
Debitage	54.24	93	1.7	12.7
Microdeb	225.48	705	3.1	23.1
FCR	353.44	187	0.5	3.9
Faunal	190.84	295	1.5	11.4

Cells	4
CCs	1.93

AA 2.4

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	21.48	26	1.2	7.3
Tools	1.56	5	3.2	19.3
Cores	1.38	3	2.2	13.1
Debitage	81.36	118	1.5	8.7
Microdeb	338.22	282	0.8	5
FCR	530.16	1571	3	17.9
Faunal	286.26	1359	4.7	28.6
Cells	6			
CCs	2.37			

AA 2.5

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	57.28	101	1.8	9.7
Tools	4.16	5	1.2	6.6
Cores	3.68	20	5.4	30
Debitage	216.96	411	1.9	10.5
Microdeb	901.92	1951	2.2	12
FCR	1413.76	1583	1.1	6.2
Faunal	763.36	3447	4.5	25
Cells	16			
CCs	2.58			

AA 2.6

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	42.96	181	4.2	28
Tools	3.12	10	3.2	21.3
Cores	2.76	4	1.4	9.6
Debitage	162.72	203	1.2	8.3
Microdeb	676.44	625	0.9	6.2
FCR	1060.32	89	0.1	0.6
Faunal	572.52	2232	3.9	26
Cells	12			
CCs	2.15			

AA 2.7

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	28.64	5	0.2	1.3
Tools	2.08	3	1.4	10.4
Cores	1.84	4	2.2	15.6
Debitage	108.48	34	0.3	2.3
Microdeb	450.96	38	0.1	0.6
FCR	706.88	1308	1.9	13.3
Faunal	381.68	3009	7.9	56.6
Cells	8			
CCs	1.99			

AA 2.8

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	32.22	50	1.6	8.7
Tools	2.34	9	3.8	21.5
Cores	2.07	4	1.9	10.8
Debitage	122.04	235	1.9	10.8
Microdeb	507.33	489	1	5.4
FCR	795.24	266	0.3	1.9
Faunal	429.39	3159	7.4	41.1
Cells	9			
CCs	2.56			

AA 2.9

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	57.28	168	2.9	14.5
Tools	4.16	14	3.4	16.7
Cores	3.68	14	3.8	18.9
Debitage	216.96	433	2	9.9
Microdeb	901.92	759	0.8	4.2
FCR	1413.76	2751	1.9	9.7
Faunal	763.36	4027	5.3	26.2
Cells	16			
CCs	2.88			

AA 2.10

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	7.16	21	2.9	13.7
Tools	0.52	1	1.9	9
Cores	0.46	3	6.5	30.5
Debitage	27.12	41	1.5	7.1
Microdeb	112.74	37	0.3	1.5
FCR	176.72	908	5.1	24
Faunal	95.42	290	3	14.2
Cells	2			
CCs	3.06			

AA 2.11

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	14.32	1	0.1	0.5
Tools	1.04	2	1.9	14.3
Cores	0.92	0	0	0
Debitage	54.24	47	0.9	6.4
Microdeb	225.48	77	0.3	2.5
FCR	353.44	1111	3.1	23.4
Faunal	190.84	1358	7.1	52.9
Cells	4			
CCs	1.92			

B 2.3

Activity Area	*2.29*	*2.34*	*2.35*	*2.36*	*2.37*	*2.39*	*2.4*
Ceramics	15	40	66	174	294	16	111
Tools	7	8	16	5	34	7	30
Cores	3	12	12	12	10	3	16
Debitage	160	213	403	540	1565	166	2544
Microdeb	487	560	839	3192	7345	646	15081
FCR	380	454	2520	2197	508	1397	1236 (gr)
Faunal	1835	990	2216	1083	1329	237	2572 (gr)

AA 2.29

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	32.22	15	0.5	3.9
Tools	2.34	7	3	25.1
Cores	2.07	3	1.4	12.1
Debitage	122.04	160	1.3	11
Microdeb	507.33	487	1	8
FCR	795.24	380	0.5	4
Faunal	429.39	1835	4.3	35.8
Cells	9			
CCs	1.7			

AA 2.34

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	32.22	40	1.2	7.7
Tools	2.34	8	3.4	21.1
Cores	2.07	12	5.8	35.8
Debitage	122.04	213	1.7	10.8
Microdeb	507.33	560	1.1	6.8
FCR	795.24	454	0.6	3.5
Faunal	429.39	990	2.3	14.2
Cells	9			
CCs	2.31			

AA 2.35

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	42.96	66	1.5	7.3
Tools	3.12	16	5.1	24.4
Cores	2.76	12	4.3	20.7
Debitage	162.72	403	2.5	11.8
Microdeb	676.44	839	1.2	5.9
FCR	1060.32	2520	2.4	11.3
Faunal	572.52	2216	3.9	18.5
Cells	12			
CCs	3			

AA 2.36

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	42.96	174	4.1	18.4
Tools	3.12	5	1.6	7.3
Cores	2.76	12	4.3	19.8
Debitage	162.72	540	3.3	15.1
Microdeb	676.44	3192	4.7	21.4
FCR	1060.32	2197	2.1	9.4
Faunal	572.52	1083	1.9	8.6
Cells	12			
CCs	3.14			

AA 2.37

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	71.6	294	4.1	15.3
Tools	5.2	34	6.5	24.4
Cores	4.6	10	2.2	8.1
Debitage	271.2	1565	5.8	21.5
Microdeb	1127.4	7345	6.5	24.3
FCR	1767.2	508	0.3	1.1
Faunal	954.2	1329	1.4	5.2
Cells	20			
CCs	3.83			

AA 2.39

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	32.22	7	0.2	2.2
Tools	2.34	0	0	0
Cores	2.07	3	1.4	14.4
Debitage	122.04	452	3.7	36.8
Microdeb	507.33	1608	3.2	31.5
FCR	795.24	472	0.6	5.9
Faunal	429.39	395	0.9	9.2
Cells	9			
CCs	1.44			

AA 2.40

Class	*Expected*	*Actual*	*C*	*% C*
Ceramics	89.5	111	1.2	4.2
Tools	6.5	30	4.6	15.6
Cores	5.75	16	2.8	9.4
Debitage	339	2544	7.5	25.4
Microdeb	1409.25	15081	10.7	36.2
FCR	2209	1236	0.6	1.9
Faunal	1192.75	2572	2.2	7.3
Cells	25			
CCs	4.22			

B 3

A Area	*3.3*	*3.4*	*3.5*	*3.6*	*3.7*	*3.8*	*3.10*
Ceramics	0	0	49	34	574	0	2
Cores	0	0	0	26	0	1	0
Tools	0	6	0	20	2	0	2
Debitage	66	117	0	1028	20	83	20
Microdeb	225	312	0	7134	5	10	0
FCR	0	72	0	562	34	0	0 (gr)
Faunal	102	301	0	1047	194	0	192 (gr)

AA 3.3

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	3.58	0	0	0
Tools	0.26	0	0	0
Cores	0.23	0	0	0
Debitage	13.56	66	4.87	44.26
Microdeb	56.37	225	3.99	36.3
FCR	88.36	0	0	0
Faunal	47.71	102	2.14	19.44
cells	1			
CCs	1.57			

AA 3.4

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	14.32	0	0	0
Tools	1.04	6	5.77	52.02
Cores	0.92	0	0	0
Debitage	54.24	117	2.16	19.45
Microdeb	225.48	312	1.38	12.48
FCR	353.44	72	0.2	1.84
Faunal	190.84	301	1.58	14.22
cells	4			
CCs	1.58			

AA 3.5

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	3.58	49	13.69	100
Tools	0.26	0	0	0
Cores	0.23	0	0	0
Debitage	13.56	0	0	0
Microdeb	56.37	0	0	0
FCR	88.36	0	0	0
Faunal	47.71	0	0	0
cells	1			
CCs	1.96			

AA 3.6

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	64.44	34	0.53	2.21
Tools	4.68	20	4.27	17.88
Cores	4.14	26	6.28	26.28
Debitage	244.08	1028	4.21	17.62
Microdeb	1014.66	7134	7.03	29.42
FCR	1590.48	562	0.35	1.48
Faunal	858.78	1047	1.22	5.1
Cells	18			
CCs	3.41			

AA 3.7

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	14.32	574	40.08	92.12
Tools	1.04	2	1.92	4.42
Cores	0.92	0	0	0
Debitage	54.24	20	0.37	0.85
Microdeb	225.48	5	0.02	0.05
FCR	353.44	34	0.1	0.22
Faunal	190.84	194	1.02	2.34
Cells	4			
CCs	6.22			

AA 3.8

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	3.58	0	0	0
Tools	0.26	0	0	0
Cores	0.23	1	4.35	40.84
Debitage	13.56	83	6.12	57.49
Microdeb	56.37	10	0.18	1.67
FCR	88.36	0	0	0
Faunal	47.71	0	0	0
Cells	1			
CCs	1.52			

AA 3.10

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	3.58	2	0.56	4.06
Tools	0.26	2	7.69	55.94
Cores	0.23	0	0	0
Debitage	13.56	20	1.47	10.73
Microdeb	56.37	0	0	0
FCR	88.36	0	0	0
Faunal	47.71	192	4.02	29.27
Cells	1			
CCs	1.96			

B 8

A Area	*8.1*	*8.2*	*8.3*
Ceramics	0	648	19
Cores	0	6	3
Tools	3	22	0
Debitage	0	565	59
Microdeb	0	0	0
FCR	0	762	2472 (gr)
Faunal	0	1684	207 (gr)

AA 8.1

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	3.58	0	0	0
Tools	0.26	3	11.54	100
Cores	0.23	0	0	0
Debitage	13.56	0	0	0
Microdeb	56.37	0	0	0
FCR	88.36	0	0	0
Faunal	47.71	0	0	0
Cells		1		
CCs		1.69		

AA 8.2

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	89.5	648	7.24	47.97
Tools	6.5	22	3.38	22.43
Cores	5.75	6	1.04	6.91
Debitage	339	565	1.67	11.04
Microdeb	1409.25	0	0	0
FCR	2209	762	0.35	2.29
Faunal	1192.75	1684	1.41	9.36
Cells	25			
CCs	2.16			

AA 8.3

Class	*Expect*	*Actual*	*C*	*% C*
Ceramics	10.74	19	1.77	9.65
Tools	0.78	0	0	0
Cores	0.69	3	4.35	23.71
Debitage	40.68	59	1.45	7.91
Microdeb	169.11	0	0	0
FCR	265.08	2472	9.33	50.85
Faunal	143.13	207	1.45	7.89
Cells	3			
CCs	2.62			

Appendix B

Summary Quantification of Faunal Recoveries by Selected Blocks and Activity Areas on Bushfield West (FhNa-10)

Grouse	🐔	Duck	🦆
Heron	🐦	Loon	Lo
Crane	Cr	Swan	Sw
Canada Goose	🦢	Unknown Bird	UB

Area		UB	🦢	🦆	Lo	Sw	🐦	Cr	🐔
B 1	1.3	29	1	8	1	9	5		29
	1.4	1				2			
	1.5								
B 2.1	2.42								
	2.43		1	1			1	2	55
B 3	3.6								
	3.7	7	1						3

Table B.1. Summary of identifiable faunal specimens (NISP) by bird species for selected activity areas excavated on Bushfield West.

Table B.2 Legend (see next page for full table)

Unknown Ungulate	♁	Muskrat	🐀
Deer	🦌	Mink	Mn
Elk	🫎	Marten	Mt
Bison	🦬	Rabbit	🐇
Lynx	Ly	Raccoon	Rc
Canid	🐺	Pocket Gopher	🐹
Beaver	🦫	Grey Squirrel	🐿
		Vole	Vo

Table B.2. Legend (above) and table (next page). Summary of identifiable faunal specimens (NISP) by mammal species for selected activity areas excavated on Bushfield West.

		♁	🦌	🦌	🦌	🦬			Ly			Rc		⇆	Mn	Mt			Vo
B 1	*1.3*	40			5	77	4			38			3	12					
	1.4	5				14				7				1					
	1.5																		
B 2.1	*2.27*																		
	2.42									2									
	2.43		1		1	37		7		57	5	2		4	3			2	2
B 2.2	*2.1*					1				3									
	2.2					18				19									
	2.3					2				1									
	2.4					8				2									
	2.5					14				14									
	2.6			1		12				2									
	2.7			1	1	11				1									
	2.8					7		1		5									
	2.9					18				18						1			
	2.10					1				1									
	2.11					1		1		2									
B 2.3	*2.29*					2				2									
	2.34					6				18									
	2.35			1		10			1	7					1				
	2.36					3				7									
	2.37					3				8									
	2.39					1		1	2	1									
	2.40					5				14									
B 3	*3.4*					2											2		
	3.6	5				8				22				1					
	3.7	1				2				5									
B 8	*8.1*																		
	8.2	7			1	11		1											
	8.3	3				1		1											

	A Area	Indeterm	Foetal	Immature	Adult
B 1	1.3	94	13	29	43
	1.4	16	2	3	6
	1.5				
B 2.1	2.27				
	2.42	1			1
	2.43	48	1	26	108
B 2.2	2.1	12		2	7
	2.2	48		8	15
	2.3	1		1	1
	2.4	10			5
	2.5	38		7	10
	2.6	13		3	7
	2.7	23		2	9
	2.8	16			8
	2.9	43	1	10	11
	2.10	5			
	2.11	4		3	1
B 2.3	2.29	10		2	
	2.34	29		1	8
	2.35	27		1	8
	2.36	27			1
	2.37	22			5
	2.39	9			2
	2.40	38		10	4
B 3	3.3				
	3.4	1		1	
	3.5				
	3.6	26		16	5
	3.7	4		3	1
	3.8				
	3.10				
B 8	8.1				
	8.2	6			14
	8.3	1			4

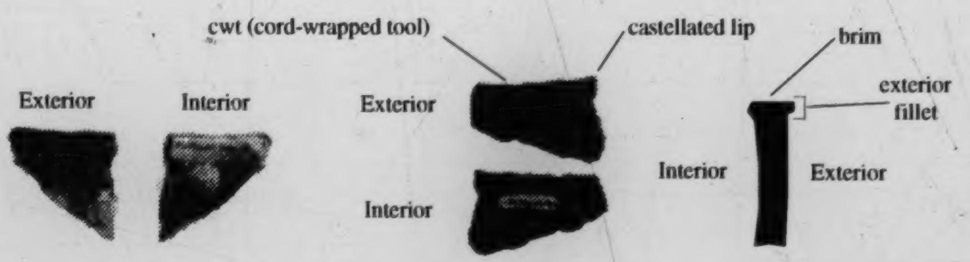
Table B.3. Summary of identifiable mammal faunal specimens (NISP) by maturity for selected activity areas excavated on Bushfield West.

	A Area	Undamaged	Burned	Modified	Chewed	Total
B 1	*1.3*	159	20			179
	1.4	27				27
	1.5					0
B 2.1	*2.27*					
	2.42	2				2
	2.43	170	9		4	183
B 2.2	*2.1*	21				21
	2.2	55		14	2	71
	2.3	3				3
	2.4	15				15
	2.5	52		1	2	55
	2.6	21		1	1	23
	2.7	31	1	1	1	34
	2.8	19		5		24
	2.9	62		2	1	65
	2.10	5				5
	2.11	6		1	1	8
B 2.3	*2.29*	11		1		12
	2.34	36		1	1	38
	2.35	35			1	36
	2.36	24	1	2	1	28
	2.37	27				27
	2.39	11				11
	2.40	27		25		52
B 3	*3.3*					
	3.4	2	0	0	0	2
	3.5					
	3.6	32	3	9	3	47
	3.7	7	1	0	0	8
	3.8					
	3.10					
B 8	*8.1*	0	0	0	0	0
	8.2	18	0	1	1	20
	8.3	5	0	0	0	5

Table B.4. Summary of identifiable mammal faunal specimens (NISP) by element condition for selected activity areas excavated on Bushfield West.

Appendix C

Description and Selected Illustration of Pottery Vessels Recovered from Bushfield West

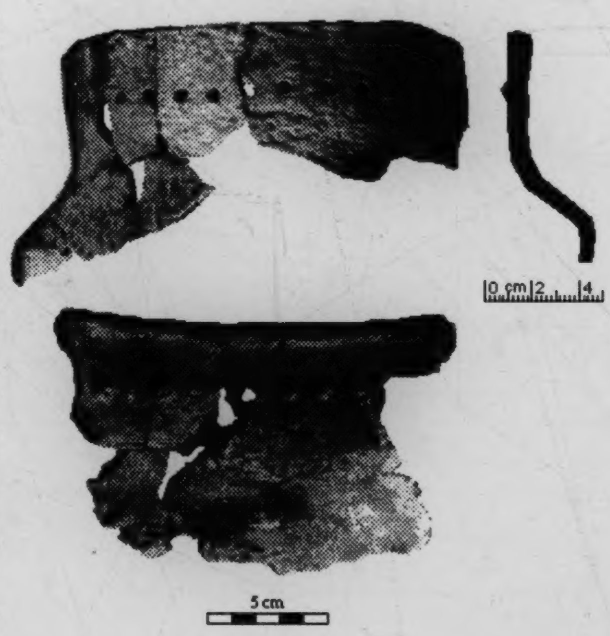


Key to pottery illustration arrangements and some special terms used in pottery descriptions

Vessel: 1

Amount This vessel has been contiguously assembled from the rim to just below the shoulder. Much of the vessel wall and base has also been reconstructed, but these sections could not be directly joined with the rim/shoulder segment. However, by extrapolation it is possible to reconstruct the entire vessel form. Thus, at least 75% of the vessel appears to be present.

Form The rim is relatively long and vertical, resting on an angular neck which leads to a flat upper shoulder. The shoulder curve is angular. The lower wall does not immediately curve inward, but appears (through composite assembly) to continue downward at a very shallow angle. The rim and shoulder are thin for the size of the vessel, and of relatively uniform thickness. Below the shoulder the vessel wall becomes even thinner right down to the base.



Vessel 1

Finish The entire exterior of the vessel is covered with a prominent fabric finish from the rim to the base. The fabric weave appears to be knotted, and is vertically oriented in the vicinity of the neck and upper shoulder. Weave orientation is less precise over the body, but continues to be linear in direction, rather than crossed. The fabric impression extends over the lip brim just into the interior of the rim. On the interior of the vessel, below the rim, the surface has been slightly smoothed. Brushing is pronounced in the neck and upper shoulder area, where striations are visible.

Paste The paste is dense but only moderately consolidated. Quartz and feldspar temper are homogeneously mixed throughout the matrix. The temper particles appear to be largely uniform in size. The outer and inner edges of a typical sherd are coloured an orange-tinted tan. The interior paste is grey. No part of the vessel bears any form of encrustation, although a few dark stains appear on the vessel exterior around the base and lower wall.

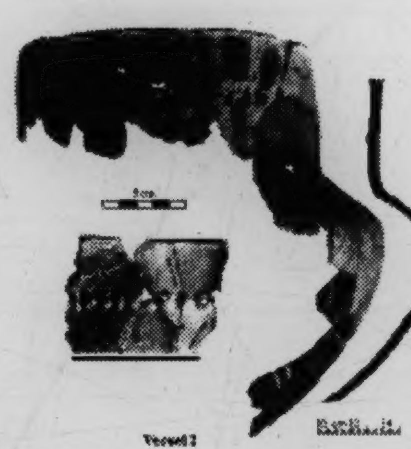
Decoration On the rim, alternating, irregular, shallow impressions appear along the inner and outer edge of the slightly rounded lip. These impressions give the rim a slight fillet on the exterior. Below the lip is a row of deep, well-rounded punctates. On the vessel interior, the punctates have produced prominent bosses which bear occasional fingerprint traces.

Comments Most of Vessel 1 was recovered as part of a large concentration of sherds in association with Vessel 8, in Activity Area 3.7. Other parts of the pot were found in Activity Area 3.6 (in a hearth remnant) and 1 m south of Activity Area 3.3. It does not appear to have been used for cooking because of the lack of carbon encrustation. Several of the sherds on the vessel appear to have been worn by water action. It is possible that the vessel was disturbed when the living floor was inundated by the fluvial sand deposit which overlaid the occupation paleosol in the Block 3 locality. This may explain why a portion of the vessel was not recovered, as those pieces may have been washed away at the time of the flood. Although this vessel does not appear to have been used for cooking, the stains appear to have been related to charring.

Vessel: 2

Amount Approximately half to three quarters of the vessel has been reconstructed from just above the base to the rim. Nearly 80% of the rim has been assembled, although only 35% of the neck. Much of the body is present, although a large section cannot be directly cross mended.

Form The rim is long and straight, with a nearly vertical orientation. The rim exterior and interior are slightly filleted. The neck is sharply angled on the exterior and interior. The shoulder is moderately to prominently angled. The vessel construction is quite delicate, but very sturdy. The vessel profile is quite thin and fairly uniform in thickness, varying little from below the rim through the shoulder and body to near the base.



Finish A fabric finish has been impressed on the vessel exterior from the base to the edge of the rim lip, and in places over onto the rim brim. It is very prominent, showing the fabric weave in great detail. The interior finish is smoothed.

Paste The paste is dense and finely tempered. The exterior of the vessel is grey and brown in colour. There is some evidence of interior encrustation in the shoulder area and on parts of the rim.

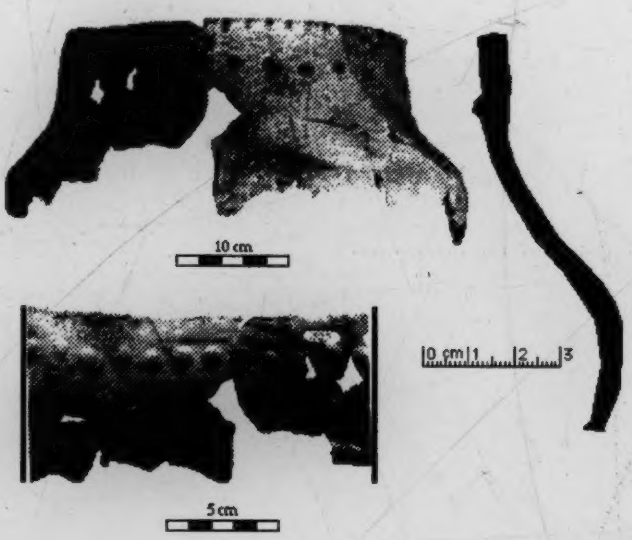
Decoration The vessel rim has a flattened lip with tiny irregular cwt impressions on the brim. Ovate, vertically oriented, low lying punctates have been spaced closely, midway between the rim lip and the neck. The punctates have produced prominent bosses.

Comments The vessel appears to be unusually short for its width, and the length of the rim. A few sherds have been charred, indicating that they were recovered from a hearth. Although very delicate, the vessel was obviously used for cooking, judging from the residue traces found on the interior.

Vessel: 3

Amount About 2/3 of the rim, neck and shoulder of the vessel are represented. There are probably a number of body sherds which can be crossmended to the vessel.

Form The rim is relatively short but straight, with a nearly vertical orientation. The neck is slightly thickened before thinning into a thin upper shoulder. The shoulder curve is moderate, with some thickening on the exterior. The vessel construction is delicate, but sturdy. The vessel profile is quite thin, and appears to be fairly uniform in thickness, from the rim through the shoulder.



Vessel 3

Finish A prominent fabric finish has been impressed on the vessel exterior from the interior edge of the rim lip to below the shoulder. The interior finish is smoothed with some scraping in the upper lip area.

Paste The paste is dense and finely tempered. The exterior of the vessel is black-grey and brown in colour, the darker patches apparently attributable to firing. The interior is lightly stained and encrusted near the shoulder curve, with a few residue patches near the rim lip.

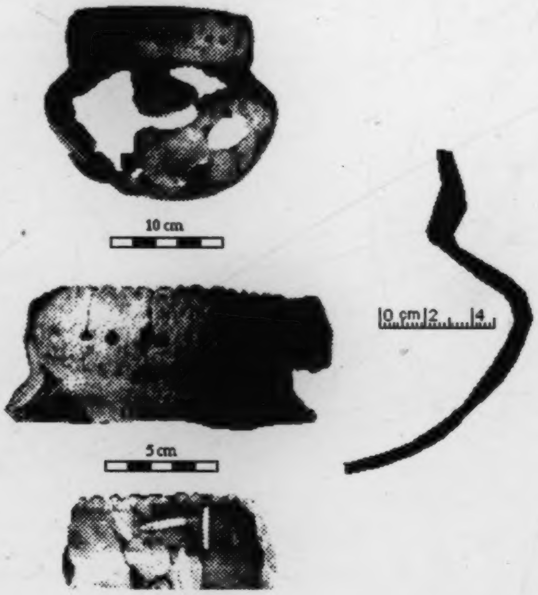
Decoration The exterior lip is decorated with vertically oriented, shortened cwt impressions. A single line of regular, round, deeply impressed punctates is present just below the lip decorations, leaving prominent, rounded bosses on the interior, which bear somewhat obliterated fingerprint traces.

Comments This is a well-made vessel, probably used for cooking, although interior encrustation is minimal. Although most of the body is missing, the angle of the lower shoulder suggests that the vessel was squat in comparison to other vessels. A few rim sherds have a reddish tinge, suggesting that they may have been charred in a fire.

Vessel: 4

Amount The entire vessel form is represented, although a small section of the rim and larger portion of the shoulder and body are missing. Approximately 75% of the vessel has been reconstructed.

Form The vessel rim is short and has a pronounced excurvate or 'S' rim shape, bulging out at the middle along the punctate line. The neck is prominently angled on the exterior, and the interior is very sharply angled. The shoulder is also prominently angled, curving outward then inward very quickly. The vessel construction is fairly robust, especially around the rim and neck, although the profile is relatively thin. The vessel is very short in relation to its width.



Vessel 4

Finish There is a faint exterior fabric impression on the upper shoulder and neck, otherwise the vessel has a smooth finish. The interior has been smoothed, with some evidence of brushing on the rim and neck area.

Paste The past is dense and well consolidated, with small and medium sized pieces of feldspar temper. The exterior is grey-black in colour with a brownish-red discoloration on the base and lower body. The interior is a little greyer in colour around the neck area. There appears to be some cooking residue around the exterior punctate area, represented as a dark stain. The interior is heavily stained, with a thin but prominent encrustation on the shoulder area. Thicker encrustation appears in the upper rim area.

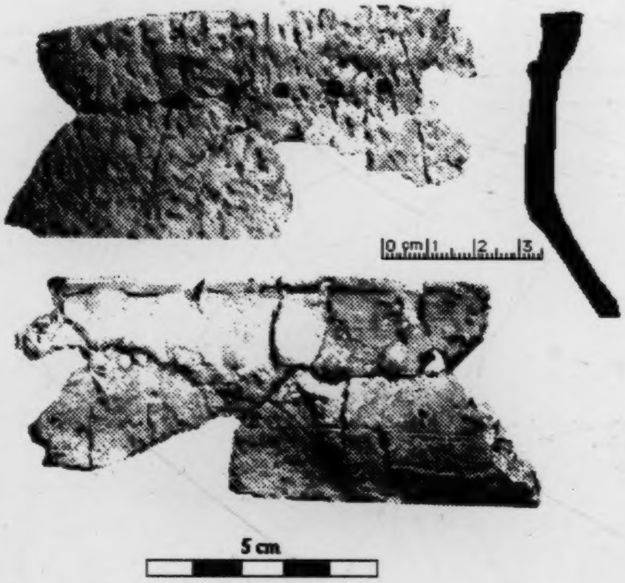
Decoration Indentations have been placed horizontally across the lip brim at a vertical angle, giving the vessel rim a saw-tooth lip decoration. Round, regularly spaced punctates have been placed midway between the rim lip and the neck on the midpoint of the rim bulge. The punctates, although deep, have produced minimal bosses on the vessel interior, probably because of the unusual thickening of the 'S' rim. Some punctates penetrate into the vessel interior, producing small holes.

Comments The incipient S-rim form and lip incising are reminiscent of plains ceramics. Saw-tooth decoration is similar to Sandy Lake in Minnesota (D. Olynyk personal communication 1988). The vessel appears to have been a well-used cooking pot.

Vessel: 5

Amount Almost the entire vessel has been reconstructed, from the rim to the base. Only a few small sherds are missing.

Form The rim is flat-topped and has a slight to moderate interior fillet and a slight exterior splay. It angles slightly outward, resting on a neck which is moderately curved on the exterior but more angled on the interior. The upper shoulder is relatively long, angling sharply downward to a long straight body area which tapers to a rounded base. The profile is thin but quite uniform, with thickening only in the neck area and at the shoulder.



Vessel 5

Finish The exterior has been impressed with a prominent fabric finish from the base to the outer edge of the rim lip. The finish has been slightly smeared around the body. The interior has been smoothed, with brush marks appearing around the rim and shoulder area.

Paste The paste is poorly consolidated, tending to exfoliate on the interior and exterior. It contains a moderate amount of white feldspar temper. The exterior is a tan brown colour, with some darker discoloration. The interior is the same, with more discoloration around the shoulder.

Decoration The exterior edge of the rim lip bears closely spaced vertical dowel impressions (not cwt). A line of tiny circular, deeply impressed punctates encircles the centre rim area. They are very tightly spaced together and often penetrate entirely through the paste, forming tiny holes in the vessel interior. Punctate bosses are small and quite prominent, many with obliterated fingerprint marks. A cluster of tiny perforations is present on the interior of the rim in one area.

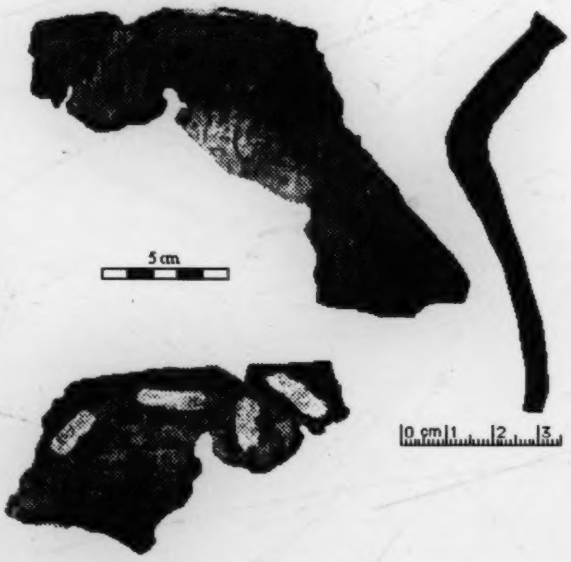
Comments Opposing perforation clusters is very unusual for Clearwater Lake and unknown for rest of collection (except for Vessel 29?). Several vessels from Nipawin region have something like this feature and one vessel from Pathlow (the Mudnick Site, according to Lenius and Olynyk [personal communication 1985] has this feature almost exactly). This site is remarkably like the Nipawin sites. D. Meyer has seen this type of decoration on Mortlach vessels (personal communication 1988). Vessel 5 was found smashed in place well away from any occupation area. Two vessel rims were found in the ceramic cluster, Vessels 56 and 57. Although their forms are slightly different, their paste strongly resembles that of this vessel. Hanna (1982, 1983) has suggested that this vessel was a discarded firing failure.

Vessel: 6

Amount Portions of the vessel from the rim to the midpoint of the shoulder are represented. Only about 15 to 20% of the rim circumference is present, however.

Form The rim lip is slightly rounded, bulging on the inner and outer corners, giving it a filleted appearance. The rim is short and flares outward at nearly 45°. It rests on a short, thick angular neck which leads to a long, straight upper shoulder. The shoulder juncture is rounded. The rim and neck are thick, although the shoulder walls narrow considerably, forming what may be a thin upper wall.

Finish A prominent exterior fabric finish covers the vessel from just below the protruding rim lip to below the shoulder. The fabric weave has a vertical orientation, and may be a sprang weave. The interior has been smoothed.



Vessel 6

Paste The paste is moderately consolidated and contains little temper. The exterior is tan in colour, with darker discolourations due to burning. The interior is a darker tan and heavily discoloured, probably by open exposure to a fire. The interior of the vessel bears a great deal of cooking residue, particularly around the lip and shoulder.

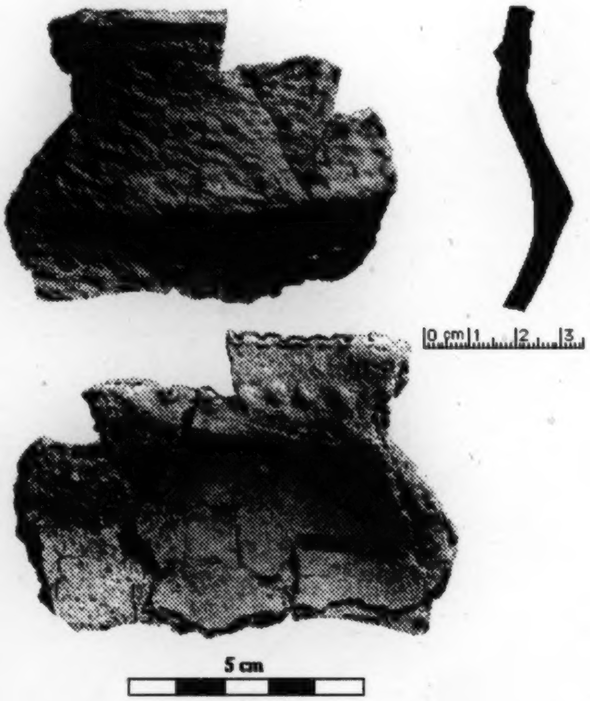
Decoration An irregular cwt line impression runs horizontally along the brim. In some places this impression has been deeply incised. A double row of punctates circles the middle of the rim. The punctates appear to be paired, although each lower punctate is offset at an angle from the upper one. The punctates are round and deeply impressed into the paste. However, very shallow bosses are formed, and the punctates occasionally penetrate into the interior, leaving a hole. Some bosses bear clear fingerprints.

Comments The overall vessel form and many decorative aspects of this vessel are somewhat aberrant for the Bushfield West collection. The multiple punctate rows are unlike anything from the Saskatchewan River area. Double punctates are found at Southern Indian Lake sites in Manitoba (Olynyk, personal communication 1988). This vessel was obviously a well-used cooking pot.

Vessel: 7

Amount The vessel has been reconstructed from the rim lip through the neck and shoulder down to the midpoint of the lower body. Just over a quarter of the body circumference is represented by the reconstruction, although less than 20% of the rim is present.

Form The rim is very short and almost vertical. On the exterior the neck flares outward and downward to a sharp, angular shoulder which slowly curves inward, presumably to the base. On the interior, the neck bulges slightly, curving gently outward and around in a smooth arc, before curving inward again to the base. The contrast of the exterior and interior forms is marked, indicating that an exterior angular shoulder has been imposed on the overall vessel form, rather than being intrinsic to its shape. The small portion of the existing rim lip is slightly warped or twisted. The lip has also been slightly rolled outward from the interior producing a slight exterior fillet.



Vessel 7

Finish The exterior of the vessel is entirely covered with a coarse fabric impression resembling twisted twine, right up to the edge of the rim lip. The vessel interior is smoothed.

Paste The paste is only moderately well consolidated, with a tendency to exfoliate on the interior. The vessel exterior is an orange tan colour, as is the interior. The paste interior is a grey colour on some sections of the vessel. There is some dark staining on the shoulder exterior, but this may be soil staining rather than darkening associated with heating. Temper is composed of a moderate to great amount of medium and small pieces of white feldspar.

Decoration The rim bears regular, oblique indentations on the brim (penetrating to the rim interior), made by a stick or bird quill. A single row of tiny, circular punctates surrounds the vessel just below the rim. Tiny prominent bosses are formed on the interior from these relatively deep punctates, which bear fingerprint impressions. The entire vessel has a reddish colour.

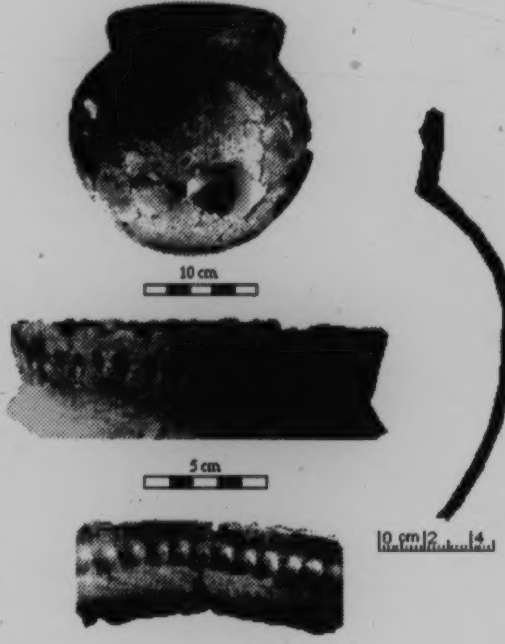
Comments Although the vessel is small it is not a miniature. The imposed angular shoulder is unusual for the Bushfield West collection. The vessel bears no encrustation or any burn marks and probably was never used as a cooking pot. The unusual construction may have made the vessel difficult to fire, and it may have been a waster. It bears a strong resemblance in form (except for the imposed shoulder angularity) to Vessel 5, from Block 5. The paste colour and texture resembles Vessels 5, 56 and 57 of that block.

Vessel: 8

Amount The vessel has been entirely reassembled from rim to base. Some sections of the body and upper shoulder are missing, but the entire rim circumference is present.

Form The rim is outflaring and rests on a thickened, angular neck. The remainder of the vessel is globular. The distinction between the shoulder and the body is difficult to determine as there is no pronounced shoulder juncture. Below the neck the thin vessel wall curves gently outward then inward with no perceptible thickening until the gently rounded base of the vessel is encountered.

Finish A fabric finish extends from the lip brim down the exterior of the vessel to its base. The fabric weave is knotted and appears to have a vertical orientation with an occasional fabric overlap at the midpoint of the vessel body. Some of this finish has been obliterated on the upper shoulder and neck by horizontal brushing. The vessel interior has been smoothed with horizontal brushing, especially in the upper rim area below the punctate bosses.



Vessel 8

Paste The paste is dense and well tempered with large and small pieces of feldspar and quartz. Laminations of clay are visible in many sherds. The outer wall of the pot is blackened, while the inner wall is grey/tan in colour. Some carbon encrustation is present on the inner and outer portions of the rim.

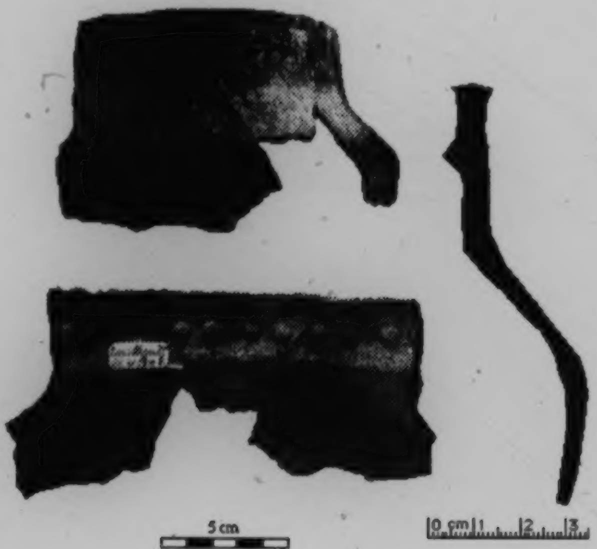
Decoration On the rim, small, vertically oriented cwt impressions appear along the outer lip. These indents have been occasionally smeared. The inner lip is undecorated, but has been slightly deformed by the outer lip decoration process. Regularly spaced and deeply impressed ovate and rectangular punctates are present below the outer lip, angling from upper left to lower right. The punctates have produced bosses on the interior of the vessel which are prominent and almost squash into one another. Many of the bosses bear fingerprints.

Comments Most of this pot was found in association with Vessel 1 in Activity Area 3.5. It is extremely thin and well made and appears to have been used for cooking, judging by the extensive blackening on the vessel exterior and by the presence of carbon encrustation on the rim and in the shoulder area.

Vessel: 9

Amount Approximately 30% of the rim, neck and shoulder are present, plus a small portion of the upper body.

Form This vessel has a short vertical rim which bears a prominent fillet on the interior lip. The rim rests on a moderately angled neck on the exterior, which appears more abrupt on the interior. The shoulder is abrupt, almost angular on the exterior, although the interior shoulder is less angular. This is caused by intentional thickening of the exterior to apparently give the impression of angular shoulders. The shoulder leads to a thin, straight upper body wall. The rim profile is relatively thin, and the body profile is very thin.



Vessel 9

Finish A smoothed corded fabric finish has been impressed on the vessel parts represented. The finish is especially prominent on the upper shoulder and neck. The interior has been smoothed, with brushing evident on the upper shoulder and neck area

Paste The vessel paste is dense and well tempered with medium and small pieces of feldspar. The exterior is brown with grey and black stains on the shoulder and upper rim area. The interior is a uniform tan colour with some dark stains in the shoulder area.

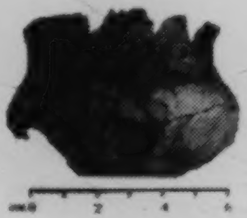
Decoration The vessel rim has a flattened lip with cwt impressions on the outer edge. The lip surface has been smoothed. Circular and oblong punctates have been regularly spaced near the rim lip, creating fairly prominent bosses. Most bosses have fingerprints.

Comments This vessel is very nicely made by an experienced potter, and is typical in form and decoration to many other vessels found on Bushfield West. It does not appear to have been used much for cooking, since it is not very stained. It may have been used more for boiling clear liquid, since the exterior is well-blackened.

Vessel: 10

Amount The entire vessel profile is represented by this tiny pot, with about half of the rim, shoulder and body circumference, and a piece of the base.

Vessel 10



Form The pointed rim lip is outflaring and short. The moderately angled neck rests on a straight upper shoulder. The shoulder juncture is thickened, and sharply rounded, abruptly leading to a short lower body with a flat base.

Finish Both the exterior and the interior have a smooth finish. There are faint horizontal scrape marks above the exterior shoulder on parts of the vessel.

Paste The paste is poorly consolidated and virtually untempered. There are large spalls on the exterior of the vessel, particularly below the shoulder. The interior has a number of smaller potlid spalls. The paste is a mottled tan colour on the exterior and the interior.

Decoration Regularly spaced vertical notches or incisions encircle the interior portion of the rim lip of the vessel. These notches extend over the brim and onto the outer edge of the rim lip, giving the vessel rim a serrated appearance. A single row of small, elongated punctates encircles the vessel midway between the rim lip and the upper shoulder. The punctates appear to have been made with a sharp instrument such as a needle or awl. The punctates have left tiny, prominent bosses on the vessel interior.

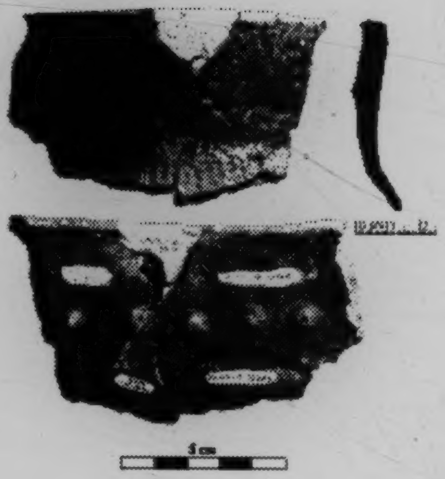
Comments The paste strongly resembles that of ceramics from Southern Indian Lake. Though the vessel is quite tiny, like a mortuary vessel, the form is similar to others on Bushfield West. It bears no evidence of use wear. It may have been a child's pot.

Vessel: 11

Amount Approximately 1/4 of the vessel circumference is represented by two sections consisting of the rim, neck and upper shoulder.

Form The vessel has a vertical rim resting on a moderately angled neck. The interior of the rim lip bulges slightly into a fillet. The upper rim is thick, but tapers to form a thinner neck area.

Finish The vessel exterior has a vertically oriented, obliterated fabric finish over most of portions represented, except for the upper rim. The rim lip may have been fabric finished, but was subsequently smoothed and burnished before firing. The interior appears to have been heavily smoothed and almost burnished.



Vessel 11

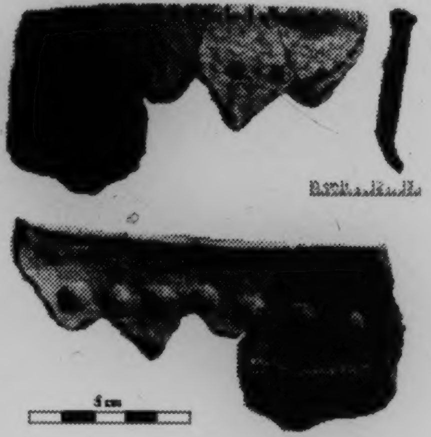
Paste The clay appears to be very dense, highly compacted and well consolidated. The temper is finely ground and homogeneous. Both the vessel interior and exterior are a mottled grey-black with some residue adhering around the punctate bosses and below the punctates on the exterior. The black colour of the paste may be due to a fine layer of some form of cooking residue that covers most of the interior and exterior.

Decoration The vessel lip is burnished, but undecorated. A single row of round, deeply impressed punctates encircles the lower rim of the vessel, near the neck juncture. The resulting bosses are large and gently rounded, and a few bear obliterated fingerprint impressions.

Comments This vessel is unusual in the density of its paste, which appears to have been very well paddled. One rim sherd was retrieved from a hearth and crossmended to the rest of the rim. This sherd was coloured a light tan from the firing. This vessel was used for cooking.

Vessel: 12

Amount Approximately 15 to 20% of the rim and neck portion of this vessel has been recovered and reconstructed.



Vessel 12

Form The rim is straight and of moderate length, angling slightly outward. The rim lip has a prominent 'T' shape, caused by pronounced exterior filleting and less pronounced inner filleting. The neck has a moderate angle, and is thin.

Finish A prominent smoothed fabric finish has been impressed on the vessel exterior from the neck to the outer edge of the rim lip and over to the inner lip. The interior surface has been floated. Faint brushing is apparent around the inner fillet and on the upper shoulder interior.

Paste The paste is well consolidated with a moderate quantity of medium and fine textured feldspar temper. The vessel exterior is a light tan colour, although a few sherds are much darker, due to differential soil staining. The interior is also a tan colour. One section of the vessel interior is much darker, stained from neck to lip.

Decoration The vessel rim has a pronounced 'T' lip with precisely applied vertical stick indentations on the outer edge creating notches which are easily visible from the exterior. Round punctates have been consistently placed in a wavy line near the rim lip. The punctates are deeply impressed into the rim, creating large, well-formed bosses which display very prominent fingerprint impressions. These prints are so precisely placed that they appear to have been some form of decorative mark, since similar prints do not appear elsewhere on the vessel.

Comments This vessel was very expertly made by an experienced potter. The clay must have been wet during the decoration process, for the fingerprint marks are exceptionally clear. An analysis of all complete prints indicates that they were impressed by the same left index finger of a young woman, with her finger oriented upward. The vessel does not appear to have been used for cooking since there is little evidence of cooking residue. It may have been used for boiling clear liquid, or for storage.

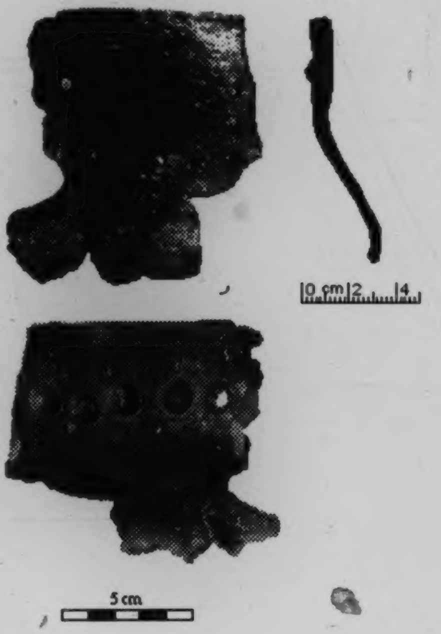
Vessel: 13

Amount The vessel is represented by approximately 75% of the rim and neck circumference, but only 10% or the shoulder.

Form The vessel lip is flat, with a slight fillet on the interior. The rim is long and vertically oriented, resting on a moderately angled neck. The upper shoulder is long and straight, leading to a sharply rounded shoulder juncture. The rim profile is thickened in the rim area, thinning somewhat in the upper shoulder region. The shoulder is thickened, but thins below into the body.

Finish A smoothed fabric finish covers the vessel from the interior rim lip edge over the exterior edge to below the shoulder. The interior is smoothed, with prominent horizontally oriented brush marks around the rim lip and in the neck area.

Paste The paste is moderately to poorly consolidated, containing a small amount of large and small white feldspar tempering fragments. The exterior is a yellow tan colour, with portions of the rim and shoulder bearing a darker stain. The interior is a little darker in colour, with more staining. The sherds have a tendency to exfoliate on the interior.



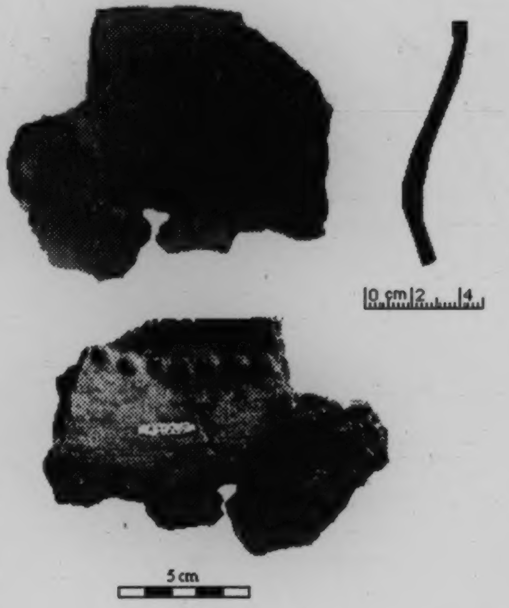
Vessel 13

Decoration The outer corner of the lip appears to bear intermittent, obliterated notches. Otherwise, the rim is undecorated apart from a fabric finish. A single row of round punctates encircles the vessel in a slightly wavy line, leaving prominent but deformed bosses on the interior. The bosses bear brush marks and highly obliterated fingerprints, and are occasionally broken off, leaving a tiny hole.

Comments This is a standard Bushfield vessel, with a fairly large orifice in comparison to the rest of the vessel. There appears to be no cooking residue present, although there is some light carbon staining on the interior. The vessel may have been used for dry storage. Paste consistency suggests that the vessel would not have stood much thermal stress from being placed on a fire.

Vessel: 14

Amount Only a small section of the rim is present, although a larger portion of the neck area is represented.



Vessel 14

Form The rim is very long and flares outward. However, the lip flares inward so that the upper rim area is oriented slightly inward. The neck is prominently curved and is thickened.

Finish The vessel exterior bears a fabric impression which has been smoothed but appears to have a vertical orientation. There has been some obliteration of this finish below the punctate row. There is a trace of this finish on the lip brim as well, but it has been largely obliterated by smoothing. The interior has been heavily brushed below the punctate bosses and smoothed above them.

Paste The paste is laminated and moderately consolidated. Large and small pieces of feldspar temper are thoroughly mixed into the matrix. The exterior of the pot has been heavily blackened and bears carbon encrustation. The interior is blackened only around the upper rim.

Decoration The vessel section has deeply impressed, elongated, nearly rectangular punctates which are closely spaced near the top of the rim. The punctate bosses are prominent and nearly squash into one another in places. The rim lip is smoothed and sharply defined on the exterior and interior.

Comments This vessel was quite large and used for cooking. The punctates are irregularly formed and the bosses are cracked, suggesting the decorations were impressed when the vessel paste was getting dry. Very little of this vessel was found *in situ* in Activity Area 3.7. Any remaining pieces of the pot were scattered outside the excavated portion of

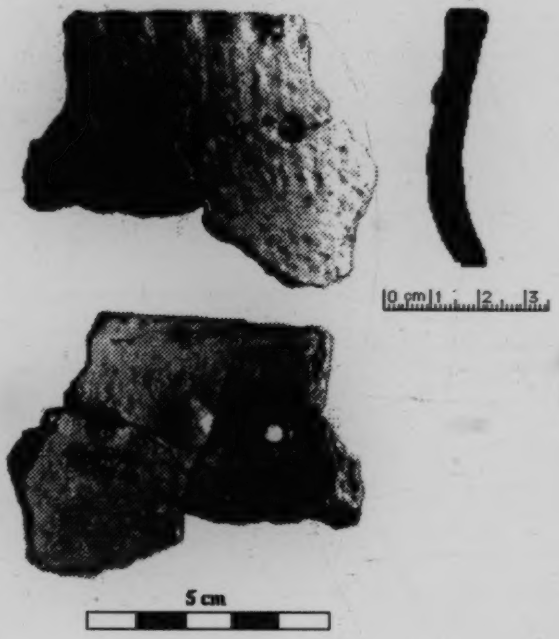
Block 3. It is also possible that this vessel fragment was intrusive to the occupation paleosol, and may have been part of the Reworked Sand deposit.

Vessel: 15

Amount This vessel consists of many fragments forming the rim and upper shoulder of a normal sized vessel.

Form The vessel rim is vertical to slightly outcurving, with a very shallow neck angle. The rim section is short and of uniform thickness with slight thickening around the neck juncture and the upper shoulder.

Finish A smoothed fabric finish extends from the inner edge of the rim lip onto the exterior of the vessel to the represented portions of the upper shoulder. The interior has been smoothed, with burnishing around the upper rim above the row of bosses, and again below the bosses but above the neck. The latter area also shows some distinct scrape marks from this burnishing.



Vessel 15

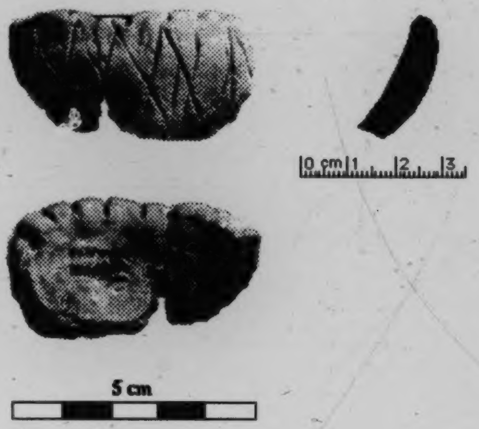
Paste The paste is orange (almost pink coloured) on the exterior and interior but grey in the centre, and is poorly consolidated. Gritty looking quartz temper is visible on smoothed portions of the exterior and interior vessel surface.

Decoration There is a regularly spaced series of vertically oriented cwt impressions on the exterior edge of the rim lip. The lip itself is flat. A single line of deeply impressed punctates circles the rim midway between the vessel lip and the neck juncture. A few bosses have fingerprints.

Comments This vessel is typical of the Bushfield West collection, although the paste is unusual in its poor quality and orange and pink colour. The vessel was probably used for storage, since there is no evidence that it was used for cooking, or was even heated over a fire.

Vessel: 16

Amount Approximately 30% of the rim and body of this tiny bowl is represented.



Vessel 16

Form This vessel is a very small bowl or cup. The rim is thin and rounded, almost bluntly pointed. From the rim, the vessel profile widens and curves inward to a thickened bowl-like base. The profile actually is somewhat variable, depending upon the portion of the vessel examined.

Finish Both the exterior and interior of the vessel are unfinished, apart from smoothing imparted to the surface as part of vessel formation.

Paste The paste is moderately well consolidated, and untempered. The exterior is a yellow tan colour. The interior is more greyish tan with some slight dark staining. The centre of the paste is grey in colour.

Decoration A series of notches has been transversely impressed across the brim from the exterior to the interior, probably by a thin piece of bone or wood. The exterior of the vessel is incised with a number of contiguous 'X' marks, resembling crosshatching. The marks extend from the rim edge to nearly the base of the vessel. There are no other decorative markings on the vessel.

Comments This bowl shows no apparent use wear. Its small size and unusual decoration suggests it may have been used for some non-domestic purpose, or it may have been the work of a child. Exterior incising suggests plains influences.

Vessel: 17

Amount Approximately 10% of the rim, neck and upper shoulder of this vessel is represented.

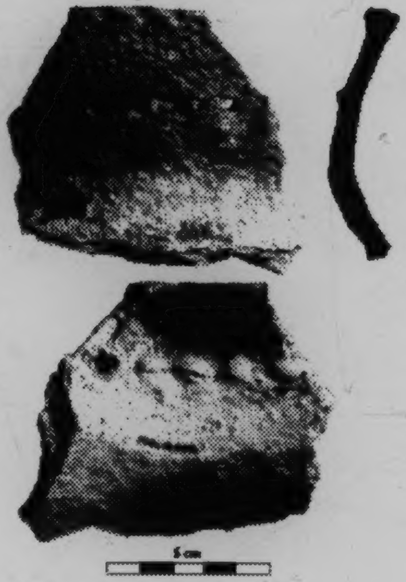
Form The rim profile is long and has an outward flare. The rim lip is flat and has a pronounced ridge on its inner edge. The neck angles shallowly and is thickened, as is the upper shoulder.

Finish A smoothed fabric finish has been impressed on the vessel exterior, extending downward from the rim edge. The interior finish is smoothed.

Paste The paste is well consolidated, containing a moderate quantity of large and small pieces of feldspar temper. The exterior is tan coloured, but heavily blackened from the neck upwards with a carbon deposit and some cooking residue. The upper shoulder is also blackened in patches. The interior is a light tan colour. Only the upper portion of the rim (above the punctate line) is blackened by carbon encrustation and food residue.

Decoration The vessel rim has a flattened lip with diagonal cwt indentations or notches on the outer edge. Deep, round punctates have been uniformly positioned midway between the rim lip and neck curve. The punctates have produced broad low bosses which bear occasional very obliterated fingerprint impressions.

Comments Interior encrustation around the rim suggests that the vessel was a large cooking pot. The pronounced outward flare is unusual for Bushfield West.

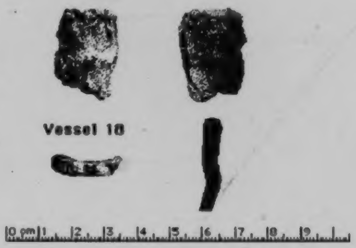


Vessel 17

Vessel: 18

Amount This miniature vessel is represented by a single sherd representing the rim, neck, shoulder and part of the lower body, although it is so poorly represented that the full extent of the vessel is unknown.

Form The rim of this vessel is nearly vertical, resting on a barely perceptible neck consisting little more than an inward bulge. The neck curves slightly outwards to a minimally formed shoulder, before curving inwards to form the lower body. The shoulder exterior appears to have been built up by pinching or applied to emphasize its form. The sherd varies little in thickness from rim to lower wall.



Finish This vessel is unfinished, apart from the smoothing that took place as part of its moulding process.

Paste The paste is poorly consolidated and prone to fragmentation. The paste contains no temper.

Decoration A series of square notches have been regularly impressed obliquely on the brim, perhaps by a flat piece of wood or bone. The vessel has no punctates.

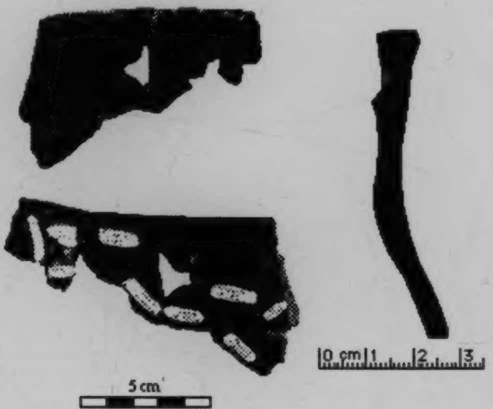
Comments This vessel is a crudely made miniature, more of a pinch pot than an attempt at making a true vessel. Its unusual form suggests a plains association. It may have been a child's pot.

Vessel: 19

Amount Approximately half the vessel circumference is represented by various portions of the rim neck and upper shoulder.

Form The vessel has a long, nearly vertical rim resting on a shallowly angled neck, which leads to a long straight upper shoulder. The exterior lip edge is slightly filleted and the inner edge has a slight ridge. The rim lip itself is flat. Apart from some lip flaring and a thickened neck, the vessel profile is relatively thin.

Finish A slightly smoothed fabric finish extends from the inner edge of the rim lip over to the outer lip and onto the entire represented portions of the vessel exterior. The interior is smoothed, with some scraping apparent on the upper interior rim.



Vessel 19

Paste The paste is moderately well consolidated although fairly dense. The vessel exterior is grey brown in colour, with extensive surface cracking. It is covered with some cooking residue. The interior is less cracked by bears more cooking residue, particularly around the punctate bosses. Temper is fairly coarse in texture, and appears to be primarily of feldspar. There is not a great quantity of temper in the paste, but there is a sufficient amount to give a sparkling effect to the vessel exterior when held up to direct light.

Decoration A regular series of obliquely impressed cwt decorations have been placed on the outer corner of the rim lip. A single row of round, deeply impressed punctates appears about midway between the rim lip and the shoulder juncture. The resulting bosses are prominent, with occasional smoothed fingerprint impressions. In places, the bosses have a burnished appearance.

Comments This is a standard vessel form for Bushfield West. The vessel is a bit friable, but was used for cooking, judging from the residue present on the inner surface.

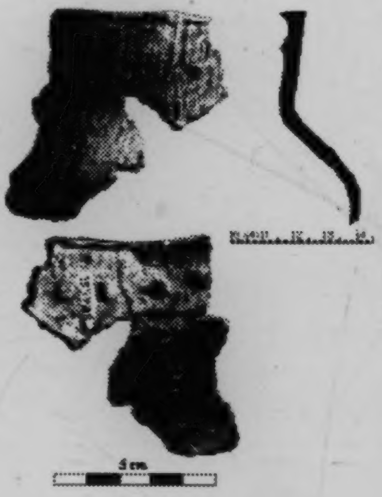
Vessel: 20

Amount Although there are many unmended fragments representing this vessel, only one section has been reconstructed sufficiently to extend below the shoulder juncture. This section represents approximately 10% of the vessel circumference.

Form This vessel has a relatively straight rim with a slight outward flare. It rests on an angular neck with leads to a straight upper shoulder. The shoulder juncture curves abruptly but is not angular. The rim lip has a distinct interior fillet or ridge. The exterior is less ridged but also has a slight filleted appearance. Apart from some lip thickening caused by filleting, the profile thickness is remarkably uniform and very thin, giving the vessel a delicate appearance.

Finish A prominent vertically oriented fabric finish extends from the edge of the lip exterior to below the shoulder. The finish is slightly smoothed at the shoulder juncture. The interior has been smoothed almost to the point of being burnished. Some scraping has been done just below the lip interior.

Paste The paste is moderately consolidated. Feldspar and quartz temper is unusually coarse for the thickness of the vessel. In places, temper fragments comprise over three quarters of the wall thickness. The vessel exterior is an orange brown colour with slight blackening in a few places. The vessel interior is a lighter tan colour. The exterior has a slightly reddish tinge, which may be due to ochre staining. Many sherds bear a reddish stain on the interior.



Vessel 20

Decoration A thin line has been incised down the centre of the lip brim, parallel with the inner and outer lip edge. A single row of round, deeply impressed punctates are positioned midway between the rim lip and the neck juncture. The interior bosses are prominent but somewhat squashed in places. Faint reddish stains appear in the vicinity of the punctate row and at the neck.

Comments This is a very finely made, small, thin vessel. A reddish tinge to the exterior suggests that this vessel may have been slipped with ochre. The interior also bears a faint reddish tinge. The lip incising is unusual, otherwise the vessel form is typical of Bushfield West. This vessel was used for storage, since it does not appear to have been heated over a fire.

Vessel: 21

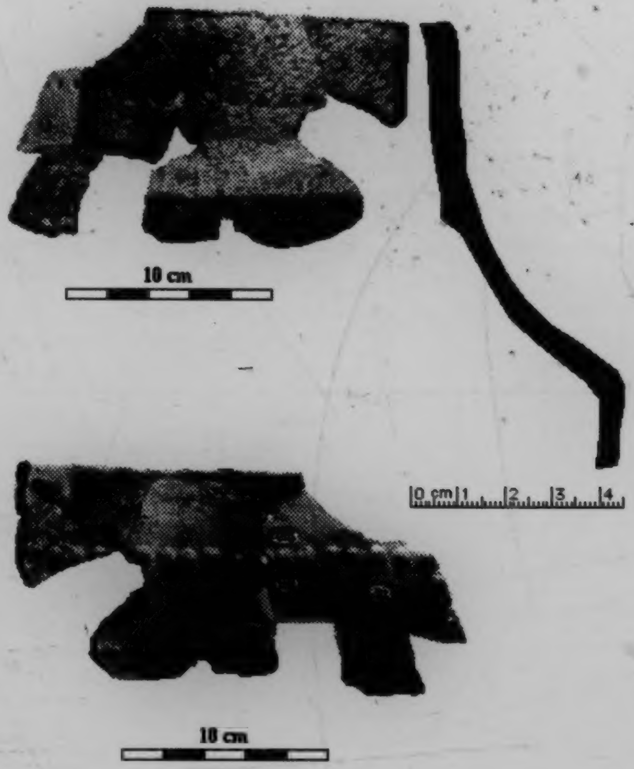
Amount Large sections of the rim, neck, shoulder and body represent this vessel.

Form This vessel has a long vertical rim resting on a shallowly angled neck. The upper shoulder is straight, leading to a sharp exterior shoulder juncture, which is less sharp on the interior. The profile maintains a uniform thickness from the rim lip to below the shoulder, with only slight thickening around the shoulder juncture, where the shoulder angularity is imposed on the exterior.

Finish A prominent knotted, vertically oriented fabric finish covers the entire represented vessel, extending over the lip onto the brim. The fabric impression is slightly smoothed at the sharp shoulder edge. The interior is smoothed to the point of being nearly burnished, particularly below the shoulder. Occasional brush marks appear on the upper rim.

Paste The paste is dense and well consolidated, containing numerous pieces of crushed feldspar as temper. The exterior is grey brown in colour, with occasional dark carbon patches. The interior is a lighter grey colour, with large patches of carbon staining.

Decoration The rim appears to be undecorated. A single, closely spaced line of very round punctates encircles the lower rim, above the neck juncture. The punctates have been deeply impressed with a hollow tool such as a reed or quill, leaving prominent bosses, which have occasionally broken away leaving a hole. The bosses have smeared fingerprint impressions.



Vessel 21

Comments This large vessel has a typical Bushfield West form, with the added unusual feature of a sharp shoulder. Although the interior of the vessel is carbon-stained, there is no trace of cooking residue, suggesting the vessel was used for dry storage or for boiling clear liquid.

Vessel: 22

Amount Approximately 20% of the rim and neck are represented.

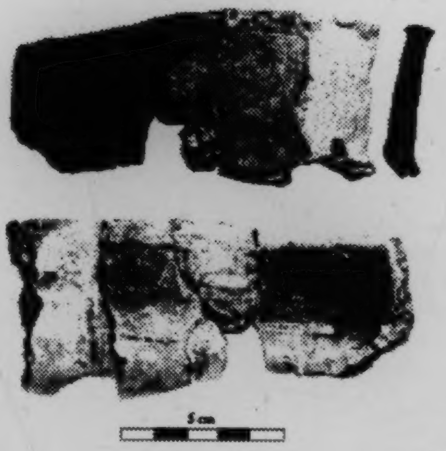
Form The rim is long and straight, with a slight outward flare. The lip appears to undulate up and down, giving it a slight castellated appearance. The neck is moderately angled on the exterior, although the interior angle appears to be more prominent due to the presence of punctates and bosses at the point of curvature.

Finish An obliterated fabric finish covers the neck and rim, extending over the lip. The interior appears to be unfinished, although the punctate bosses have a burnished look.

Paste The paste is moderately consolidated, with a tendency to exfoliate on the interior. The temper is composed of large feldspar fragments which are not uniformly distributed within the paste. The vessel exterior is dark brown with carbon staining and food residue adhering to the lip area. The interior is a lighter tan colour, with some vessel sections exhibiting carbon encrustation and food residue.

Decoration The vessel rim has a flattened lip with cwt indentations on the outer edge. A single large cwt notch diagonally crosses the lip from exterior to interior. Punctates are deep, irregularly shaped and closely spaced in a line along the neck juncture. They have produced minimal bosses on the interior.

Comments Interior encrustation suggests that this vessel was a cooking pot. The single cwt crossing the vessel lip suggests a quartering decoration. This and the possibly castellated form is unusual for Bushfield West. However, the rest of the vessel decoration and form fit in well with the Bushfield collection. One rim sherd was burned in a fire.



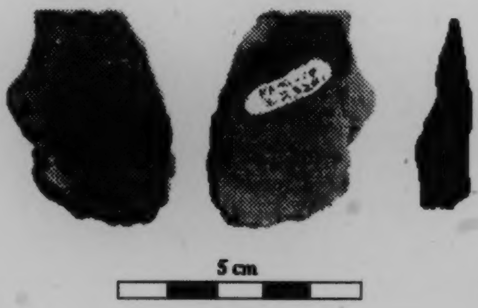
Vessel 22

Vessel: 23

Amount A single rim sherd with insufficient lip surface to determine vessel orientation.

Form The rim has an unusual shape in that the profile is quite thick in the area of the punctates, but tapers to a blunt point at the lip. The vessel form may be conoidal or even represent a fragment of a plate, but there is insufficient remains to determine what the true form should be.

Finish The exterior of the sherd is smoothed, although there is a suggestion that a fabric finish may have been present prior to the smoothing process. The interior of the sherd has been scraped horizontally and roughened.



Vessel 23

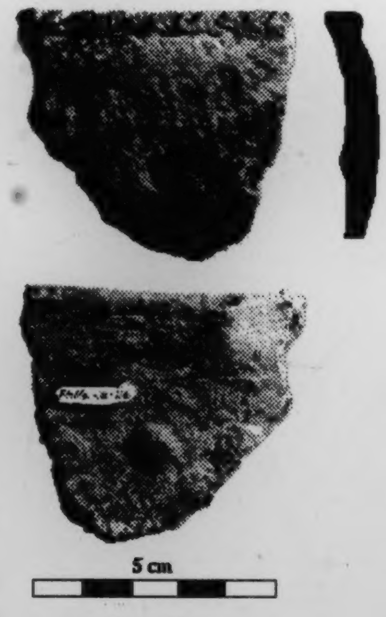
Paste The paste is sandy in texture and laminated, showing a poorly consolidated matrix. There is some feldspar and quartz temper, of varying sizes. The exterior and interior faces of the sherd are darkened by carbon; the internal material is orange-grey in colour. The paste may in fact be composed of river silt rather clay.

Decoration The rim lip is thin and is marked by an oblique notch. There is no other lip decoration. Two punctates are present, impressed deeply by a rectangular tool oriented at an oblique angle. Despite the depth of the punctates interior bossing is minimal. The bosses have been deformed by interior scraping.

Comments This sherd was found in Activity Area 3.10. Another unidentifiable body sherd was also found in the locality but could not be directly associated with Vessel 23.

Vessel: 24

Amount This vessel is represented by a single large rim sherd which ends at the neck area.



Vessel 24

Form The rim is flat, flaring inward slightly, with a trace of an exterior fillet. The rim gradually curves outward, then inward again to the neck area. This gives the vessel a slight 'S' rim. The general profile is quite thin and uniform.

Finish The exterior has a highly smoothed fabric finish. Most of this finish has been entirely removed by horizontal brushing in the upper rim area. The interior has been slightly smoothed, with more horizontal brushing around the upper rim.

Paste The paste is dense and well-consolidated, containing a moderate amount of medium and small fragments of feldspar temper. The exterior of the sherd is grey-black in colour, with traces of food residue in the punctate area. The interior is a grey tan colour, with food residue encrusted around the punctates.

Decoration The exterior of the rim lip has been precisely impressed with a close-spaced series of angled cut lines. These markings do not extend to the interior of the lip, the edge which has been carefully unmarked and appears to be almost burnished. A line of round, widely spaced punctates appears on the lower portion of the rim, just above the neck area. The punctates have been deeply impressed, leaving prominent bosses on the interior which bear faint, obliterated fingerprints.

Comments This 'S' rim vessel was a large well-made cooking pot.

Vessel: 25

Amount This small vessel is represented by a portion of the rim, neck and upper shoulder.

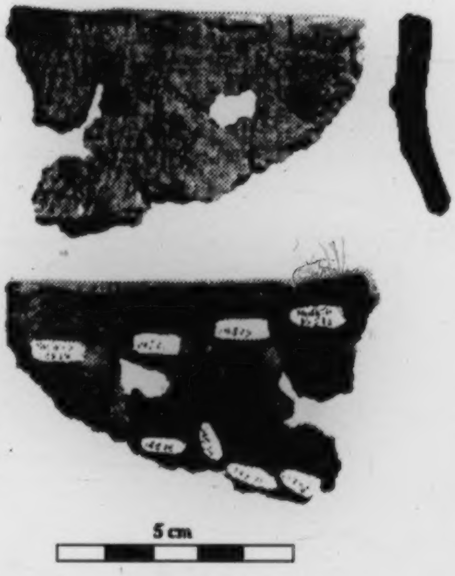
Form The flat lipped rim is nearly vertical, but slopes out slightly at the very shallow neck. The upper shoulder is long and straight. The rim area is thick in profile, tapering slightly in the neck region.

Finish A smoothed finely-woven fabric finish extends from the lip brim over the outer surface of the vessel. The interior is smoothed.

Paste The paste is moderately well consolidated, containing a small amount of finely ground temper. The exterior and interior are slightly cracked. The exterior is grey brown in colour, bearing carbon stains and cooking residue, particularly around the punctates. The interior is black and heavily encrusted with cooking residue.

Decoration A single row of large, irregularly spaced, round punctates encircles the midpoint of the rim. Interior bosses are covered with encrusted cooking residue. The rim lip is undecorated.

Comments This vessel is standard Bushfield West in form. It was used a great deal for cooking, judging from the accumulation of cooking residue found encrusted on the vessel interior.



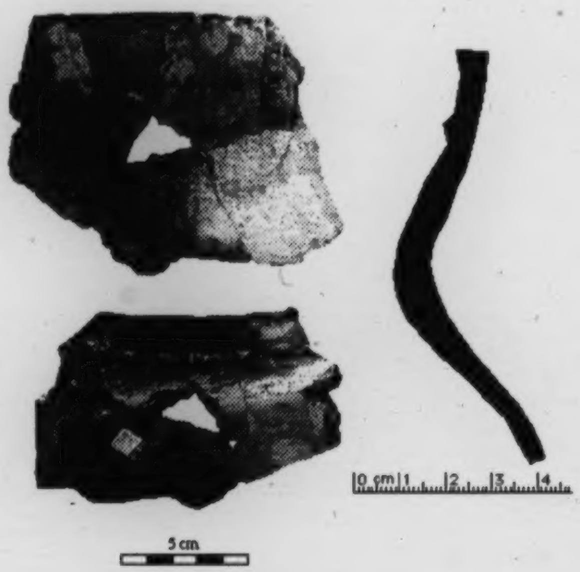
Vessel 25

Vessel: 26

Amount This vessel is represented by approximately 35% of the rim, neck and upper shoulder.

Form The rim is flat topped with a slight interior fillet. The straight rim flares outward from the shallowly angled neck. The neck interior is sharper than the exterior. The profile is thin at the upper rim, thickening in the neck area, then thinning again in the upper shoulder.

Finish An obliterated fabric finish covers the exterior of the vessel up to the rim lip. Some faint brushing is apparent in the upper rim area. The interior has been horizontally brushed, particularly in the upper shoulder area.



Vessel 26

Paste The paste is well-consolidated, containing a moderate amount of white feldspar temper. The vessel exterior is a grey tan colour, with some darkening due to carbon and food residue staining. The interior is tan coloured, with thick deposits of food residue encrusted on the rim area, around the punctate bosses.

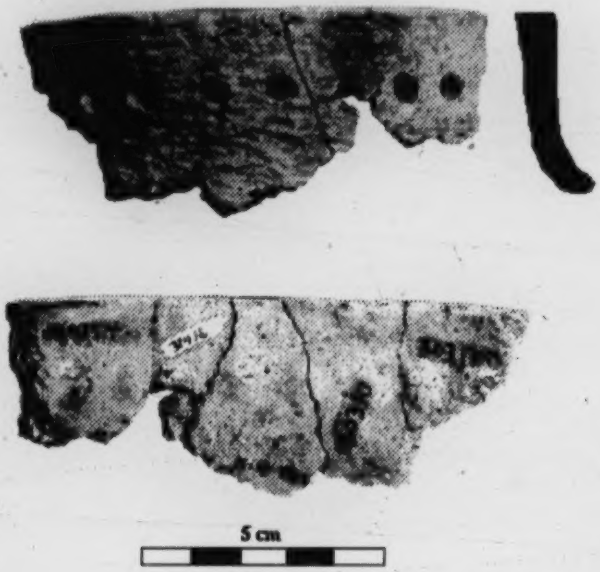
Decoration Oblique cwt impressions appear on the outer edge of the rim lip, penetrating to about the centre of the brim. A line of widely spaced, smallish, circular punctates has been deeply impressed at the centre of the rim, leaving shallow bosses which occasionally have broken away leaving a small hole.

Comments This was a large cooking pot, very similar in size and shape to Vessel 29, with which it was associated when the remains were recovered in Block 10. Significant differences from V 29 are the lack of quartering, different placement of lip decoration and absence of fingerprints.

Vessel: 27

Amount This vessel is represented by a portion of the rim and neck, perhaps 15-20% of the circumference.

Form The rim is nearly vertical, resting on a moderately angular outflaring neck. The upper rim is thicker than the neck area, and has a slight to pronounced flare on the interior, depending upon the portion of the rim examined. The lip is large and flat.



Vessel 27

Finish A highly smoothed fabric finish covers the lip and extends over all of the represented vessel exterior. The fabric appears to be more prominent below the punctate row, and has a horizontal orientation almost resembling a continuous line of twisted cord. The interior is only slightly smoothed, and actually appears to be roughened.

Paste The paste is moderately consolidated, containing a considerable amount of variably sized feldspar temper. The exterior is tan coloured with a slight carbon smudge on the upper rim. The interior is slightly darker with a faint blackening in the neck area. The paste surface appears cracked, as if the vessel did not dry properly but was fired anyway.

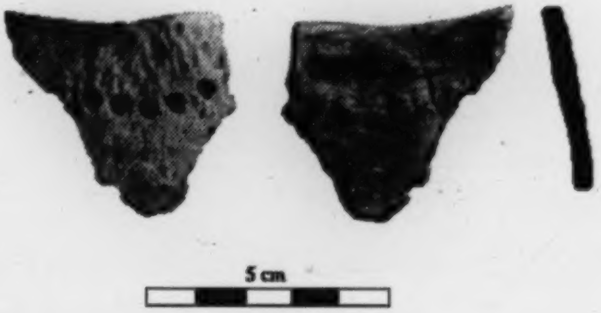
Decoration The rim is undecorated. A single line of round punctates has been impressed into the mid rim area using a tool with a rounded, hollow tip, such as a quill. Wide but not very prominent bosses appear on the interior.

Comments This vessel is of the standard Bushfield West form, although small. It was never used for cooking or heating, by all appearances.

Vessel: 28

Amount This tiny vessel is represented by a single rim sherd.

Form The sherd is of uniform thickness and appears to be part of a small conoidal pot or bowl. The flat rim lip appears to undulate in height, giving it a castellated appearance. Although it was difficult to orient the sherd, the rim appears to be insloping.



Vessel 28

Finish The sherd exterior has been impressed with fabric, particularly above the punctates. Fabric impressions have been obliterated below the punctate line. The interior has been partially smoothed.

Paste The paste is moderately consolidated, with large and small pieces of crushed feldspar temper. There is evidence of cracking on the interior around the punctate bosses. The sherd exterior is tan coloured, with some darkening near the rim. The sherd interior is slightly darker and has an orange tint. The interior of the paste is grey in colour, suggesting the vessel was fired on the exterior and interior in an oxidizing atmosphere.

Decoration A single row of closely spaced round punctates encircles the vessel. The punctate line appears to undulate, paralleling the undulation of the rim lip. The resulting bosses are small and not prominent. The rim is undecorated.

Comments This tiny vessel is unusual in its apparent conoidal form and undulating rim shape. It is possible that the sherd represents a vessel with a pronounced 'S' rim, but this does not seem likely given the apparent small circumference of the vessel orifice. The vessel was not used for cooking, nor for heating on a fire.

Vessel: 29

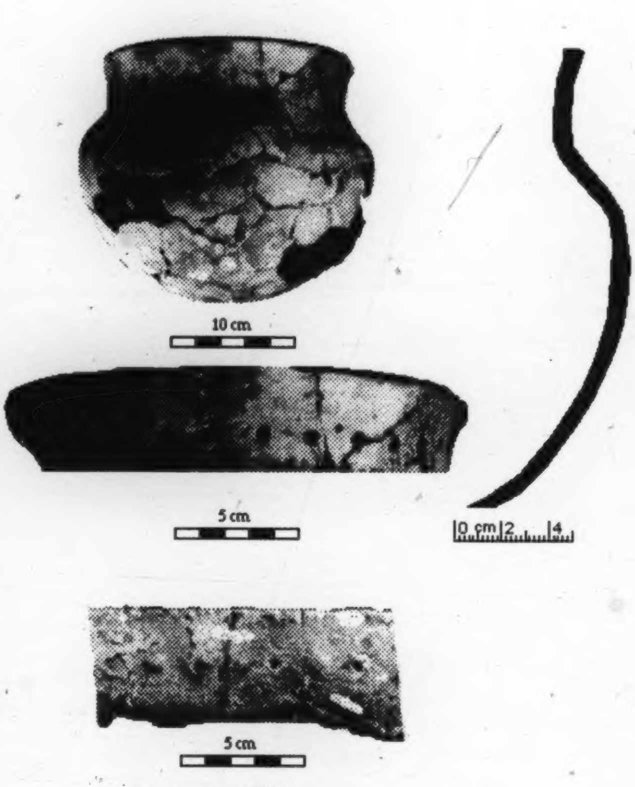
Amount Almost the entire vessel has been reconstructed, from the rim to the base. Only small sections of the body are missing.

Form The vessel rim is straight and moderately outflaring. The rim lip is slightly rounded. The rim rests on a moderately angled neck. The upper shoulder is short, with the actual shoulder juncture being only moderately rounded. Below the shoulder the body curves inward in a circular arc to the base. The profile is uniform in thickness from the rim to the base with only a little thickening at the neck and at the shoulder.

In the latter area the exterior seems to be slightly built up in comparison to the interior, as if the shoulder angle was emphasized.

Finish A smoothed fabric finish covers the entire vessel from the rim brim over onto the exterior to the vessel base. Above the punctate line the fabric finish is nearly obliterated by smoothing. The interior is smoothed.

Paste The paste is well consolidated, containing a small amount of finely ground dark quartzite temper. The exterior is a grey brown colour with occasional dark carbon stains around the neck and on the vessel base. The interior is also a grey brown colour, but is heavily stained with carbon over most of the surface, and also bears a thick encrustation of cooking residue from the shoulder area up to the rim edge. The residue layer is particularly thick in the rim area.



Vessel 29

Decoration The rim has a series of tiny, vertically oriented cwt decorations impressed on the inner edge of the lip. Four probable thumb impressions appear on the interior lip, representing a quartering decoration technique. A single row of precisely round, deeply impressed punctates appear midway between the neck juncture and the rim lip, creating prominent, precise bosses which bear well formed fingerprints.

Comments This completely reconstructed vessel was obviously a well used cooking pot. Although the rim is outflaring, the overall vessel appearance fits in well with the Bushfield West collection. The interior rim quartering is unusual, however. This vessel was found associated with Vessel 26, which closely resembled it. The vessel paste was intensively examined by Malainey (1985) using INAA techniques to determine the variability in trace element content throughout the vessel. She found that paste compositional variability did not significantly vary; therefore it was probable that INAA analysis could feasibly be carried out on any part of a particular vessel with some reliability. The study further suggested that when such material studies are carried out on incomplete vessels, the results can be reliably compared.

Vessel: 30

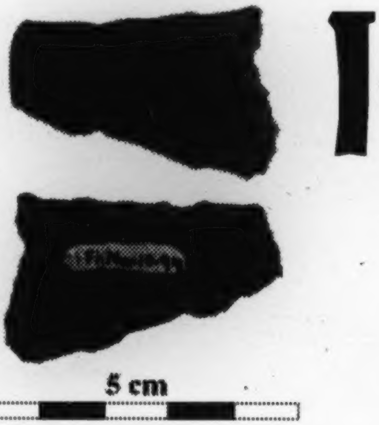
Amount The vessel is represented by a single rim sherd

Form The vessel rim appears to be vertically oriented, with slight filleting on the exterior and interior, caused by lip decoration. The interior lip edge is quite sharp.

Finish A smoothed fabric finish covers the sherd exterior from the edge of the rim lip. The interior has been smoothed by horizontal scraping.

Paste The paste is moderately well consolidated with a moderate amount of variably sized feldspar temper. The exterior is orange brown in colour. The interior is orange grey.

Vessel 30



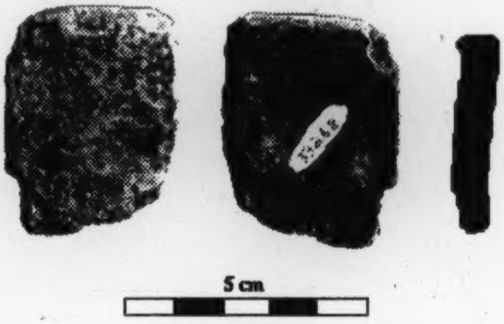
Decoration Oblique, very distinct cwt impressions have been regularly placed along the exterior edge of the rim lip.

Comments The clay must have been very moist to form such distinct impressions on the lip. There is not enough of the vessel represented to determine if punctates were present. The vessel was probably used for storage since it does not appear to have been heated on a fire.

Vessel: 31

Amount This vessel is represented by a single rim sherd, with a portion of the neck present.

Form The flat rim may be vertically oriented, resting on a slightly outflaring neck. The rim is thick, and has a slight fillet on the interior.



Vessel 31

Finish A smoothed fabric finish extends over the exterior from the lip edge. The interior has been smoothed.

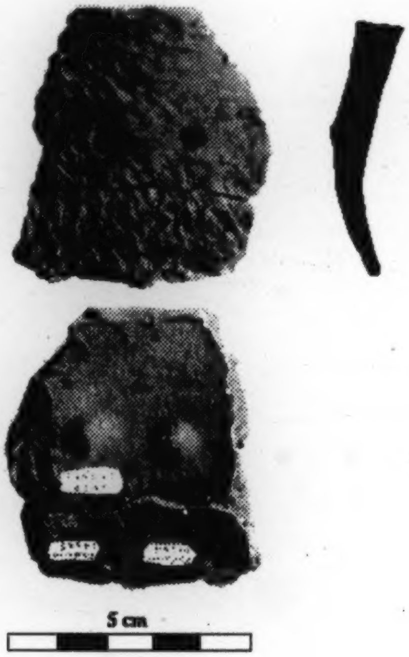
Paste The paste appears to be quite dense and well consolidated. There is a variable amount of coarse feldspar temper in the paste, some of it well crushed and some rather coarse. The exterior of the sherd is dark brown in colour and stained with black carbon and cooking residue. The interior is encrusted with cooking residue.

Decoration The rim lip may have shallow, irregular stamp impressions on the brim. There may also be a series of notches on the exterior of the rim lip, ground into the paste after the firing process. A single row of widely spaced punctates encircles the vessel, far down the rim near the neck. The punctates are deeply impressed and do not appear to follow a straight line. On the interior, the punctate bosses are prominent, bearing very faint fingerprint traces.

Comments The apparent lip decorations may be the result of post-depositional disturbance. Orientation of the sherd is only an estimate; the rim may angle outward to a greater degree. This vessel was probably a cooking pot.

Vessel: 32

Amount Various fragments comprising a section of rim and neck.



Vessel 32

Form The rim angles outward slightly, resting on a moderately curving neck. The rim lip is slightly rounded, with a trace of filleting on the interior and a slight flare on the exterior. Although the upper rim is quite thick, the neck thins appreciably and the upper shoulder is thin.

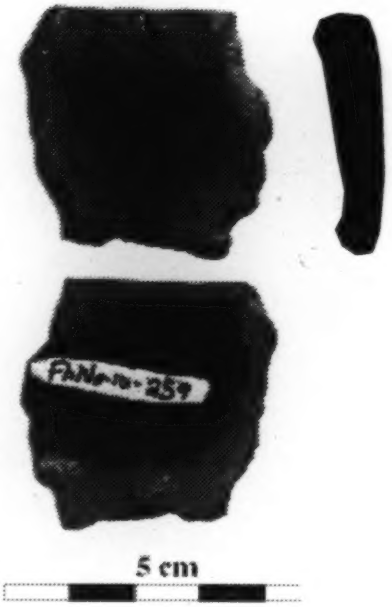
Finish A fabric finish extends from the outer edge of the lip down to the upper shoulder. However, the finish is nearly obliterated by smoothing in the area above the punctates. The vessel interior has been smoothed to the point of being burnished or floated. There is evidence of brushing in the vicinity of the punctate bosses.

Paste The paste is dense and well consolidated. Temper is of quartz and feldspar, and appears to be a uniform, small size. The vessel exterior is dark brown to black in colour; the interior is black with a thin film of cooking residue present around the bosses.

Decoration The flat lip appears to bear faint stamps which are shaped like fabric knots. They are not connected however, and appear to be offset evenly with decorative indents located on the outer corner of the lip. These latter marks are occasionally quite faint and may be cwt, although some appear to be plaits or knots as well. They appear to be widely spaced. A single row of very round, deeply impressed punctates is located well down on the rim. The punctates have produced prominent bosses with fingerprint impressions.

Comments Vessel form and decoration are standard for Bushfield West. This vessel was probably a small cooking pot.

Vessel: 33



Vessel 33

Amount This vessel is represented by a single rim sherd with partial punctates showing.

Form The vessel rim appears to be vertical, with a rounded lip. There is a suggestion that the rim may be slightly 'S' shaped, although there is really insufficient rim area to determine this positively.

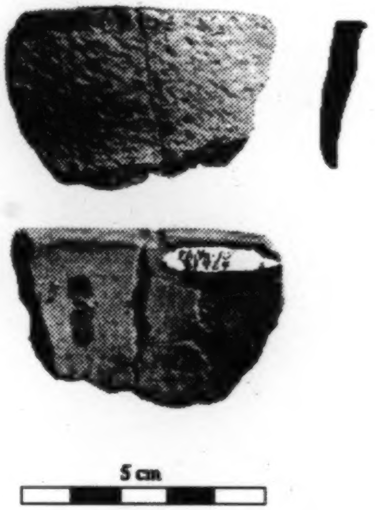
Finish A smoothed fabric finish extends from the edge of the lip down the exterior. The interior is smoothed. The rim lip is burnished.

Paste The paste is dense and well consolidated, containing only a small amount of finely ground dark quartzite or sand temper. The exterior of the sherd is grey black with cooking residue present on the lip edge. The interior is more grey in colour, with blackening (cooking residue?) on the upper rim area.

Decoration A series of deeply impressed vertically oriented cwt impressions is present on the outer edge of the lip, intruding to nearly the centre of the lip brim. A series of round, deeply impressed punctates appear well below the rim, leaving large, wide bosses with prominent fingerprints.

Comments This vessel was probably a cooking pot.

Vessel: 34



Vessel 34

Amount Although many rim fragments are present, only two pieces could be crossmended sufficiently to form a rim and neck portion.

Form The rim is flat lipped and slightly outcurving, resting on a shallowly curved neck. The rim body bulges below the lip, which is slightly filleted on the exterior. The rim thickness decreases towards the neck.

Finish A dense, finely woven fabric impression covers the exterior of the sherd up to the rim lip. The interior is smoothed.

Paste The paste is moderately consolidated, tending to exfoliate on the interior. It has a small amount of finely ground feldspar temper.

The exterior of the sherd is tan orange in colour, as is the sherd interior. The paste interior is grey. The exterior has a reddish tint to it, suggesting it may have been stained with ochre.

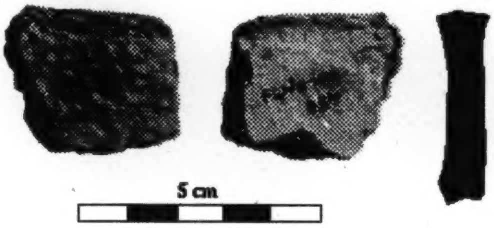
Decoration This vessel does not appear to have any punctates. The rim lip has oblique cwt impressions applied at close intervals around the exterior. There appears to be a cwt notch applied at very intermittent intervals on the interior extending across brim to the exterior, perhaps representing a quartering decoration.

Comments Although this vessel has no punctates it still appears to resemble the Bushfield West form. At least three miscellaneous unattached rim sherds from this vessel exhibited an interior notch. These sherds probably represent less than a third of the entire vessel circumference. This suggests that the interior notch may occur more often than four times, which is unusual for most pottery of this type, where quartering is the norm. The ochre stains on this vessel associate it with Vessels 20 and 37, both which came from the same area (Block 2.3) where intensive ochre processing took place. Interestingly, the stains are present only on the exterior of the fragments which currently represent the vessel.

Vessel: 35

Amount The vessel is represented by several rim sherds.

Form The rim appears to be vertically oriented, with slight filleting on the exterior and interior rim lip. The lip itself is flat. The rim thickens as it approaches the punctate line.



Vessel 35

Finish A knotted fabric finish covers the sherd from the interior of the rim lip over onto the sherd exterior. The fabric finish is almost entirely obliterated on the lip, but only partially smoothed on the exterior, primarily by horizontal scraping. The interior is smooth with some scraping.

Paste The paste is moderately to well consolidated, with laminations visible on the inside of the sherd paste. A moderate amount of variable sized feldspar temper is present in the paste. The exterior is grey in colour, and the interior is a lighter tan colour.

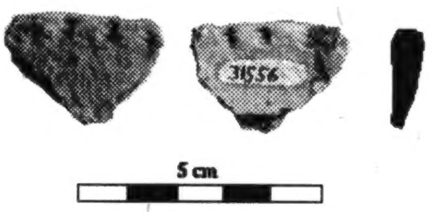
Decoration A regular series of long, cwt impressions run obliquely across the rim lip from the interior left to the exterior right. They do not penetrate into the rim interior, although they are visible from the exterior. Punctates are located well down the rim and are somewhat elongated and vertically oriented. These punctates have left poorly formed bosses on the interior.

Comments Parts of this vessel were found on the surface and parts were recovered from the Reworked Sand deposit. There is no evidence that this vessel was ever used for cooking.

Vessel: 36

Amount This vessel is represented by a few tiny rim sherd fragments which could not be reliably oriented.

Form The vessel is poorly represented. Therefore, it is difficult to determine the vessel form. However, by roughly combining what rim sherds are present, it seems that the rim is slightly outflaring. The rim sherd is flat topped with rounded edges, possible tapering to a thin neck.



Vessel 36

Finish A partially smoothed fabric finish covers the exterior. The interior is smoothed.

Paste The paste is very friable and poorly consolidated, causing the sherds to split longitudinally. The sherds are very light grey, resembling a light ash colour, both on the exterior and interior. They appear to have been severely charred in a fire, which may account for the poor condition of the paste. The vessel temper, which is not homogeneously distributed throughout the paste, appears to contain limestone as well as quartz and feldspar.

Decoration Alternating diagonal cwt notches appear on the inner and outer edges of the rim lip. This gives the vessel rim a zig-zag appearance. A single punctate boss is present on the interior, which has a fingerprint trace.

Comments The alternate notching on the lip is unusual for Bushfield West, although it is duplicated in other vessels from the site. This vessel does not appear to have been used for cooking, although it is so badly charred that cooking remains may have been obliterated.

Vessel: 37

Amount Various parts of the rim, neck and shoulder represent this vessel. A section of the vessel has been reconstructed to just below the shoulder juncture.

Form The vessel has a flat lipped, vertically oriented rim which rests on a moderately outcurving neck. The upper shoulder is long and straight. The shoulder juncture is sharply rounded, nearly angular. Although little of the lower body is connected to the shoulder, the trend of the lower wall remnants suggests that the vessel is quite short, almost squat. Despite its size the vessel walls are thin, making the form appear quite delicate.

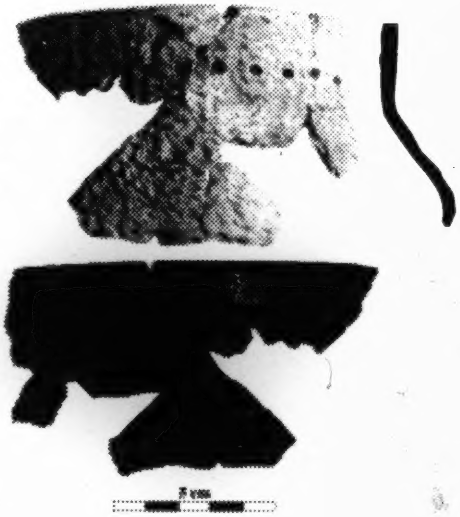
Finish A prominent exterior fabric finish extends from below the shoulder to the lip. The interior is smoothed, and there is some brushing above the punctate bosses.

Paste The paste is only moderately consolidated since the exterior and interior of many sherds tend to split There is only a small amount of variable sized quartz and feldspar temper. The vessel exterior is an orange brown colour. The interior is more red than orange. Both sides of each sherd, as well as the interior, appear to be very oxidized as if the vessel were fired in an oxidizing atmosphere. The interior is heavily stained with red ochre.

Decoration The rim lip is smooth, nearly burnished. A single row of small, off-round punctates encircles the vessel at the centre of the rim. These deeply impressed punctates have produced prominent bosses with fingerprint impressions.

Comments This vessel is a standard Bushfield West type. It has a wide orifice in comparison to the rest of the body. The lack of cooking residue suggests that it was not used for cooking, and may have been used for some kind of storage, probably of liquified ochre. This vessel closely resembles Vessel 20 in form and finish, some of which was found in Block 2.3. Most of this vessel also came from Block 2.3. The association of ochre staining with Vessel 20 (and Vessel 34) suggests that all three vessels were used for ochre manufacturing and/or storage. During fingerprint analysis using laser light, the interior of this vessel distinctly fluoresced, perhaps because of the ochre staining.

Vessel 37



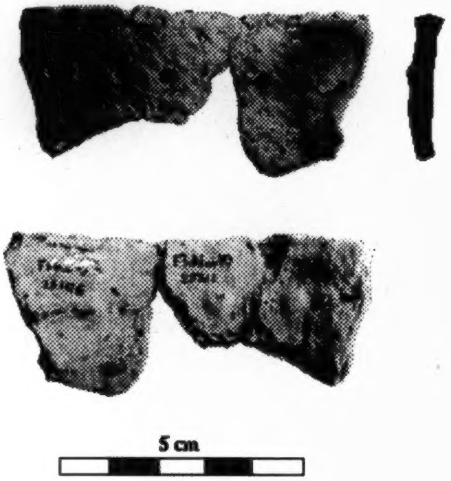
Vessel: 38

Amount This vessel is represented by nearly 50% of the rim and neck.

Form The rim is nearly vertical, with a slight outflare. The flat rim lip bulges out a bit, possibly because of the decoration that has been impressed upon it. The neck barely curves outward.

Finish A brushed and smoothed fabric finish covers the exterior to the rim lip. There are brush lines below the lip, immediately above the punctate row. The interior has not been smoothed and appears to be quite rough.

Paste The paste is poorly consolidated with all the sherds tending to split apart. It also appears to be well tempered with fine pieces of feldspar and quartz. The vessel exterior is a yellow tan colour, with



Vessel 38

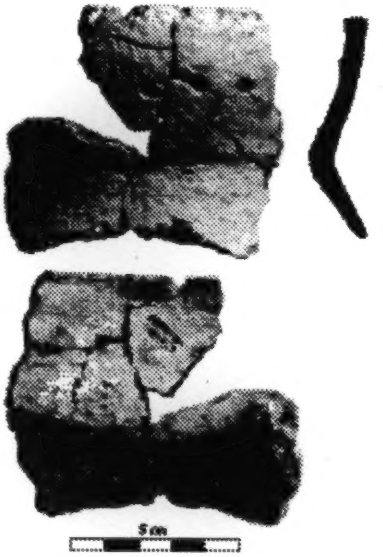
occasional black stains as if part of the vessel were used for heating. The vessel interior is much the same colour. The paste interior is occasionally grey in colour.

Decoration A single row of tiny circular punctates encircles the vessel at the centre of the rim. These have left small, somewhat deformed bosses on the interior. The rim lip has been impressed at irregular intervals with rectangular stamp impressions, which have deformed the lip area occasionally. There appears to be no particular pattern to the stamping.

Comments This small vessel has the same general form as other vessels on Bushfield West, except that the paste is poor and the lip decoration is unusual. It was not used for cooking, but may have been used for boiling liquid.

Vessel: 39

Amount This vessel is represented by nearly 50% of the rim, neck and upper shoulder.



Vessel 39

Form The vessel has a outwardly angled, flat topped rim which curves inward to a thickened, nearly angular neck. The neck area is large and outcurves to a long, straight upper shoulder which tapers slightly. The overall effect is an unusually large rim with an incipient 'S' profile. The rim lip has an interior fillet.

Finish A smoothed fabric finish extends from the inner corner of the lip over onto the exterior of the vessel to the upper shoulder. There has been some brushing below the neck juncture. The interior has been smoothed or possibly floated, with some brushing in the upper rim area and around the neck juncture.

Paste The paste is poorly consolidated, and contains a great amount of temper, composed of large pieces of white feldspar. The paste could not have been paddled very well, for the temper is quite apparent on the vessel exterior and interior. The vessel exterior is a tan brown colour. The interior is also a tan colour, although the upper shoulder area is discoloured by a grey stain which resembles charcoal. The sherd interior is grey in colour, perhaps suggesting that the vessel had been fired in an oxidizing atmosphere.

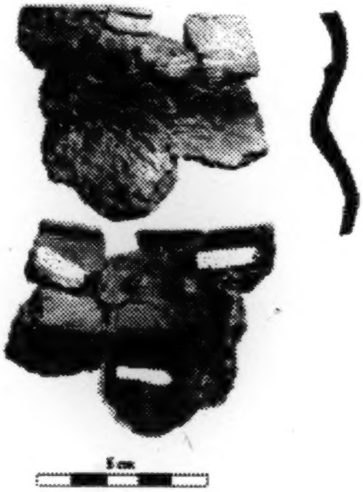
Decoration Obliterated cwt impressions have been regularly placed on the outer edge of the rim lip. A single row of round punctates encircles the vessel at the centre of the rim, leaving low bosses on the interior.

Comments The incipient 'S' rim form is not usual for Bushfield West, although the decorative form is quite standard. Although there is some charcoal staining on the vessel interior, this vessel was not used as a cooking pot. It may have been used for some form of boiling, but the paste is so poor that it is doubtful that it would have survived on a fire. It may have broken up before much use was made of it.

Vessel: 40

Amount This vessel is represented by several large sections of rim, neck, shoulder and lower body.

Form The upper rim is curvate, sloping outward then inward to a moderately outcurving neck. The rim lip is flat and slopes inward towards the vessel centre. The interior edge of the lip is sharp and possibly filleted. The upper shoulder is straight, with a moderately curved shoulder juncture. Based on the curve of the lower body, the vessel appears to be fairly short below the shoulder. Once reconstructed, the vessel has an unusually large orifice, a pronounced 'S' rim and is relatively squat. Despite its smallness it is quite well made, with thin walls and a delicate appearance.



Vessel 40

Finish The exterior is has a smoothed fabric finish from the rim edge to below the shoulder. The upper rim finish is highly obliterated by smoothing and brushing. The interior has been smoothed by scraping, leaving prominent striation marks.

Paste The paste is moderate to well consolidated, with occasional fragmenting. The clay contains a small amount of finely ground feldspar and quartz temper. The exterior is grey brown with abundant black staining, and traces of cooking residue. The interior is very dark brown, with occasional thick cooking residue encrustations, particularly in the upper rim area.

Decoration The rim lip is smoothed, with possible random marks which may be remnant knotted fabric impressions. A single row of round, deeply impressed punctates encircles the vessel just below the 'S' rim bulge. The resulting bosses are not prominent, and have been deformed somewhat by scraping. A few have been broken away, leaving holes in the vessel.

Comments This vessel shows the standard Bushfield West form, although it has a pronounced 'S' rim profile. Cooking residue suggests that it was a well used little cooking vessel. It closely resembles Vessel 4 from Block 1.

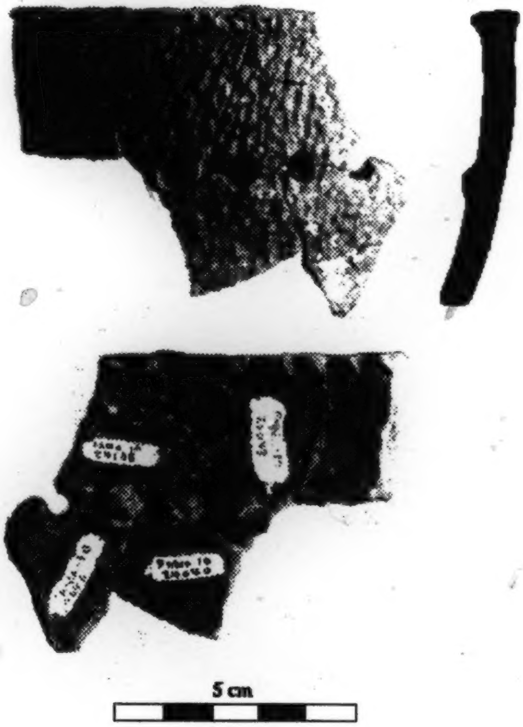
Vessel: 41

Amount A large section of the rim, neck, shoulder and lower body represents this vessel.

Form The flat rim is long and vertically oriented, resting on a moderately outcurving neck. The upper shoulder is long, bulging slightly outward. The shoulder juncture is sharply angular, curving quickly inward to form a short lower body. Although the upper rim is thick, the neck and shoulder are actually thinner, and delicately formed.

Finish A prominent fabric finish extends from the inner corner of the rim lip over the exterior edge and down the side of the vessel. The interior has been smoothed, especially around the punctate bosses.

Paste The paste is well consolidated, containing variable sized bits of feldspar and quartz temper. The exterior is grey black, and coated with traces of cooking residue on the upper shoulders and around the upper rim. The interior is a tan colour, but heavily stained black with carbon and cooking residue, especially on the upper rim, where the residue forms a crust.



Vessel 42

Decoration The rim is undecorated. A single line of round, closely spaced punctates encircles the vessel midway between the neck and the rim lip. On the interior, bosses formed by these punctates have been smoothed or even burnished.

Comments This vessel, although quite short, displays a classic Bushfield West form with a high rim and prominent shoulders. It was very well made and, although quite small, was obviously used for cooking.

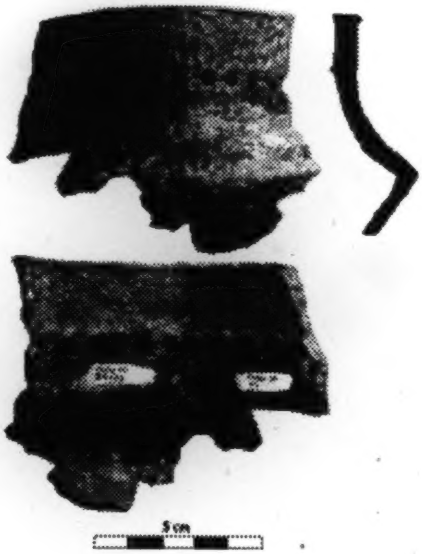
Vessel: 42

Amount This vessel is represented by several rim sections, a rim and partial neck section, and a partial neck, shoulder and lower body section. Although the shoulder and rim cannot be directly crossmended, there are sufficient vessel parts available to create a composite vessel profile.

Form Based on a profile reconstruction, the vessel has a long, vertical rim which slopes inward slightly to a moderately angular, outcurving neck. The upper shoulder is long and straight and the shoulder juncture curves quickly down to the lower body. The rim lip is 'T' shaped, probably due to deformation caused by lip decoration impressions. Despite the size of the vessel, the rim, neck and shoulder are thin and delicately formed.

Finish A prominent obliquely oriented fabric finish covers the exterior of the vessel from the edge of the rim lip to below the shoulder. The fabric impressions may have been smoothed around the neck area and at the shoulder juncture. The interior has been smoothed.

Paste The paste is well consolidated and dense, with only a small bit of finely ground temper apparent in the clay. It appears to have been well paddled. The exterior is grey black with cooking residue stains around the upper rim and on the shoulders. Bits of mica in the clay or temper give the exterior a sparkling appearance in strong light. The interior is also grey black, and bears heavy cooking encrustations around the upper rim and above the shoulder.



Vessel 41

Decoration The rim surface is flat but has been deformed significantly by a series of wedge shaped impressions or notches placed repeatedly around the inner corner of the lip. A single row of punctates has been deeply impressed around the vessel low down on the rim. Prominent bosses with faint fingerprint impressions appear on the vessel interior.

Comments This large vessel fits in well with the Bushfield West collection, though the inner corner lip decoration is unusual. The vessel was used for cooking.

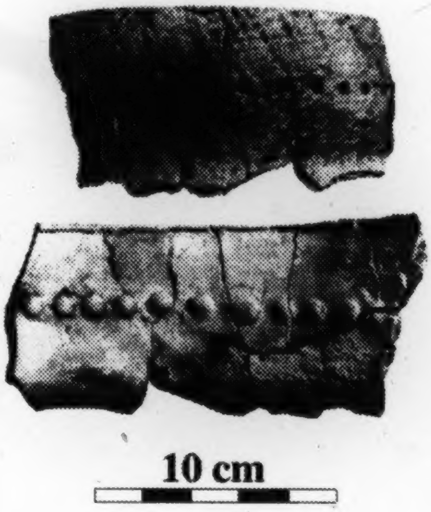
Vessel: 43

Amount This vessel is represented by several large sections of rim and neck.

Form The rim is long, thin, and vertically oriented. It rests on a moderately curved neck. The rim lip is flat with a sharp interior fillet. The profile is thin in comparison to the large vessel size.

Finish A prominent fabric finish extends from the inner lip edge over the brim and onto the exterior of the vessel, down to the neck. The interior has been highly smoothed, and perhaps washed with a wet cloth or some other fabric. Some brushing has also been done in the neck area and near the upper rim.

Paste The paste is very well consolidated, containing a small amount of variable



Vessel 43

sized feldspar temper. The exterior is tan coloured, with some brown staining. The interior is a lighter tan colour, with some brown and black staining.

Decoration The rim lip is undecorated, apart from fabric impressions trailing over from the vessel exterior. A single row of round, deeply impressed punctates encircles the vessel midway between the neck and the rim lip. These have produced prominent, well formed bosses which have clear fingerprint impressions on them.

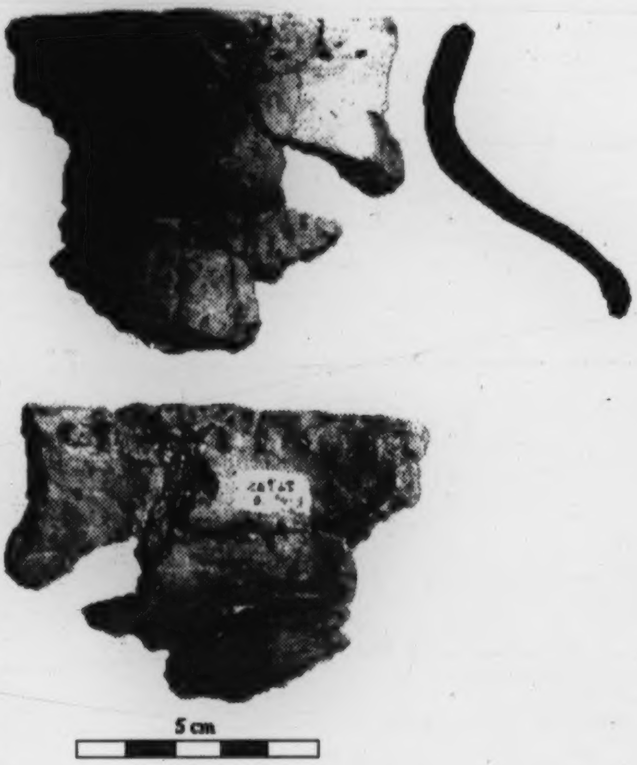
Comments The rim sections represent part of a large, well made vessel showing a standard Bushfield West form. This vessel bears no encrusted cooking residue, although unusual brown stains are present in the area of the punctates. It may have been used for storage or water boiling.

Vessel: 44

Amount Several large sections of rim, neck and shoulder represent this small vessel.

Form The short, pointed upper rim flares outward and rests on a strongly outcurving neck. The upper shoulder is long and straight. The shoulder juncture is abrupt (sharply rounded) but not angular. The rim and neck area and the shoulder juncture are thicker than the upper shoulder.

Finish A coarse, vertically oriented fabric finish covers the shoulder and lower neck of the vessel exterior. The exterior above the neck has been smoothed. The interior has been slightly smoothed and brushed, but still appears to be rough in texture.



Vessel 44

Paste The paste is poorly to moderately consolidated, with a tendency to crumble and exfoliate on the vessel interior. The clay contains a small quantity of variable sized feldspar temper. The vessel exterior is grey brown in colour with occasional dark stains and a few tan discolourations, perhaps caused by differential heating during the firing process. The interior is a splotchy grey colour with temper fragments showing, suggesting that the clay surface had not been paddled as much as the exterior, where very little temper shows.

Decoration The rim lip has been highly smoothed, almost burnished. The brim has been decorated with rectangular stamps or notches, which have been impressed deeply into the paste at an angle using a sharp, pointed object such as a reed or a stick. A single line of tiny, deeply impressed punctates encircles the vessel just below the rim lip. Tiny, deformed and occasionally punctured bosses appear on the interior of the vessel.

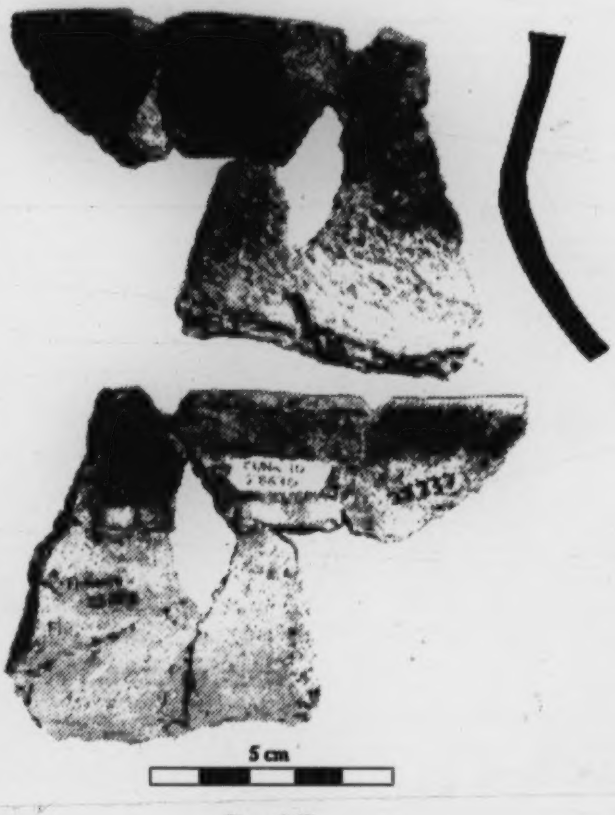
Comments The form and decorative style of this pot is not standard for Bushfield West. It is more like Clearwater Lake pottery from northern Manitoba. This vessel has some resemblance to a vessel retrieved from Nickerson Mound 'R' in southwestern Manitoba (Capes 1963:140-141, Plate IX-11). The mound vessel does not appear to be punctated. This vessel was never used as a cooking pot, and it is doubtful it would have stood much heating. It may have been used for storage.

Vessel: 45

Amount This vessel is represented by a large portion of the rim and neck, plus a second large rim section.

Form The upper rim flares outward, resting on a moderately outcurving neck. The upper shoulder of the vessel is long and straight. The rim lip is flat, and has a pronounced interior fillet.

Finish A coarse fabric finish covers the vessel exterior from the outer edge of the rim lip to the upper shoulder. This impression has been smoothed above the punctates in some areas. The vessel interior has been smoothed, particularly in the neck area where some scraping is



Vessel 45

evident. The upper rim is rougher in texture, however.

Paste The paste is only moderately consolidated, tending to fragment and exfoliate on the exterior, and crack on the interior. The clay contains a small to moderate amount of variable sized quartz and feldspar temper. The vessel exterior is grey tan in colour with heavy black food residue staining above the punctates. This residue is thickly encrusted around the upper rim in some areas. The interior is a dark tan colour. More black food residue appears near the upper rim and over onto the lip.

Decoration A series of cwt impressions is present on the outer edge of the rim lip. A single large indentation, formed by a finger or thumb, appears on the inner edge of the one rim section. This may indicate a halving or quartering decorative attribute for the vessel. A single row of round, small punctates appears near the neck juncture, leaving moderate sized bosses with fingerprint impressions.

Comments The vessel form is much like Bushfield West, although the rim flares outward. Decorative aspects are much like other pots from the site. This vessel was a large cooking pot.

Vessel: 46

Amount This vessel is represented by a single rim sherd.

Form The rim has a flat lip which flares outward in profile, deformed by the decoration which has been impressed on the lip.

Finish An obliterated fabric finish covers the exterior. The interior is rough, possibly due to paste exfoliation.

Paste The paste is friable and appears to be laminated. It is tempered with a small amount of small sized quartz and feldspar pieces. The exterior is black in colour, while the interior is a light tan.

Vessel 46

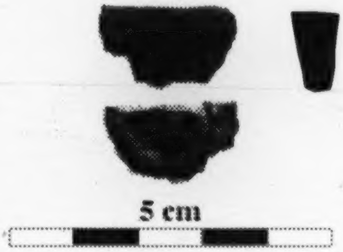
Decoration The lip has been impressed with wide cwt decorations placed across the brim. These have deformed the lip area, making it flare out on the exterior and interior. A trace of two punctates appears at the base of the sherd.

Comments The punctates are located well down on the rim. The small size of sherd makes it impossible to determine vessel form. The vessel does not appear to have been used for cooking.

Vessel: 47

Amount	This vessel is represented by a single rim lip fragment.
Form	The rim lip is flat and squared off. There is a suggestion of a possible shallow 'S' rim.
Finish	The sherd exterior and interior appear to be smoothed.
Paste	The paste is moderately consolidated with a moderate amount of light and dark quartzite and feldspar temper.
Decoration	The rim lip has been smoothed.
Comments	The vessel is poorly represented.

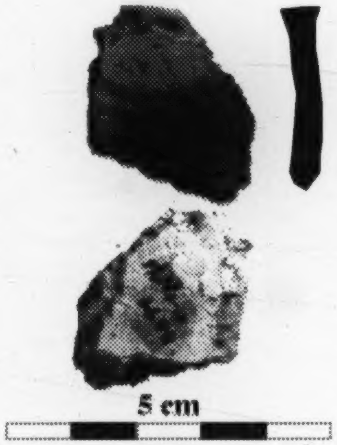
Vessel 47



Vessel: 48

Amount	This vessel is represented by a single rim sherd.
Form	The rim is long and straight. Its orientation is indeterminate because of the small size of the sherd. The rim lip has an exterior fillet.
Finish	The exterior of the sherd has a fabric finish. The fabric impressions have a horizontal orientation. The interior has a burnished look.
Paste	The paste appears to be poorly consolidated, containing medium and small pieces of feldspar temper randomly distributed within the paste matrix. The interior surface exhibits cracking. The exterior is tan coloured with a black carbon stain below the rim. The interior is tan coloured.
Decoration	The vessel rim has a flattened lip with diagonal cwt impressions placed alternately on the inner and outer corners. A trace of a punctate is found on the interior of the sherd with a corresponding boss on the exterior.
Comments	Alternating indents on the lip and reverse punctates are aberrant for the Bushfield West collection and these traits are found elsewhere only on Vessel 66, which was recovered nearby. The two vessel remnants may in fact represent a single vessel. The sherd thicknesses and rim profiles vary significantly between the two vessels, however, and they do not crossmend. Type of use cannot be interpreted.

Vessel 48



Vessel: 49

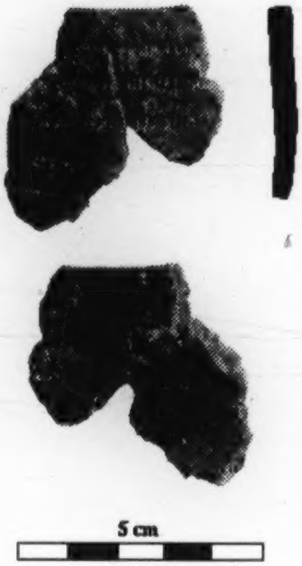
Amount This vessel consists of a single rim sherd.

Form Although there is very little lip surface, it appears that the rim is nearly vertically oriented, with a slight incurve at the base of the sherd. This may represent a shoulder, in which case the vessel would be conical and quite small. Alternatively, the incurve may represent the start of an incipient 'S' rim neck area. The sherd is of uniform thickness from lip to base. The rim tends to undulate in height, suggesting it may be castellated.

Finish The exterior of the vessel has a very smoothed fabric impression. The interior is smoothed with some brushing apparent near the lip.

Paste The paste is only moderately consolidated, with a tendency to crumble. Large and small pieces of feldspar temper the clay. The exterior of the vessel is grey brown in colour, as is the interior. The sherd interior (paste) is a light tan colour.

Decoration The rim lip is smooth, with evidence of some brushing. At least 5 parallel lines of horizontal cord (or dentate) marks encircle the vessel. A punctate remnant appears at the very base of the sherd, where the profile curves in.

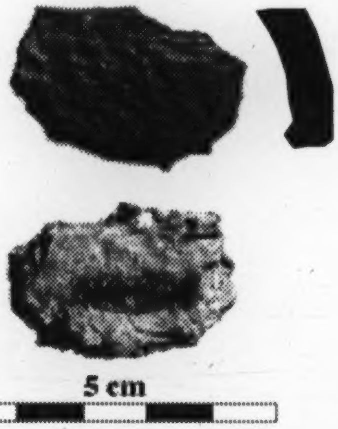


Vessel 49

Comments If a punctate is present, the vessel appears to show the standard Bushfield West form with a high straight rim. The possible castellation and horizontal decorative lines is unusual for the site, however. The lines are suggestive of the Nipawin Horizontal type. This does not appear to have been a cooking vessel.

Vessel: 50

Vessel 50



Amount This vessel is represented by a single rim sherd with a punctate remnant.

Form Little of the rim is present; however there is some indication that the rim curves inward, suggesting an 'S' rim profile. The rim lip is flat and slopes outward.

Finish A fabric finish extends from the lip down the sherd exterior. The interior is roughened.

Paste The paste is moderately well consolidated with large and small pieces of white feldspar temper. Both the exterior and interior are grey in colour.

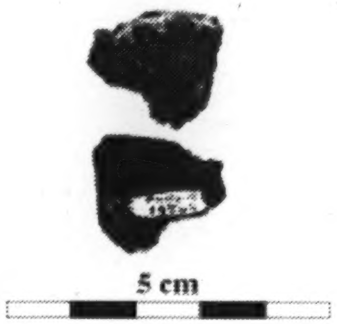
Decoration The lip is smooth. A deeply impressed punctate remnant is present, leaving a poorly formed interior boss.

Comments The bulging shape of the sherd suggests that it may have an incipient 'S' profile. There is no indication that the vessel was used for cooking.

Vessel: 51

Amount This vessel consists of many tiny sherds of which only the upper rim is represented.

Vessel 51



Form The rim lip is flat and very smooth with a rounded or rolled interior edge with pronounced flaring or filleting. The exterior edge is quite rounded

Finish The exterior and interior appear to be smoothed.

Paste The paste is not well consolidated, with variable amounts of finely ground quartzite temper. The vessel exterior is grey with black stains. The interior is black with extensive cooking residue.

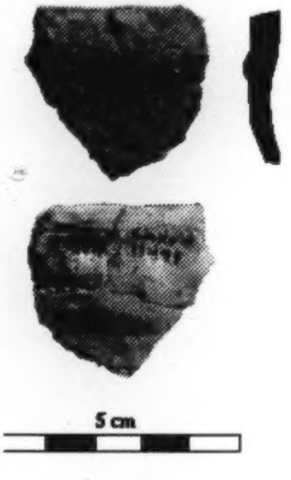
Decoration Punctates are present on a few sherds, which could not be connected to a rim section.

Comments This vessel is too fragmented to make much comment. The rolled interior lip edge is unusual. Whatever the vessel looked like, it was apparently used for cooking.

Vessel: 52

Amount This vessel is represented by a single rim sherd with neck and upper shoulder attached.

Form The upper rim is vertical in orientation, resting on a weakly outcurving (and nearly absent) neck and relatively straight upper shoulder. The upper rim is short and is vertical when viewed from the point of view of the interior profile. From the exterior, however, the rim is incurvate before curving out again at the neck. This gives the vessel an overall incipient 'S' profile that appears to have been applied as a form of decoration, rather than being intrinsically part of the vessel form. The rim lip is flat but leans inward at an angle. Also, the lip appears to undulate in height, suggesting that the vessel has a castellated rim. This makes it very difficult to secure a true vessel form.



Vessel 52

Finish A fabric weave has been impressed on the exterior from the lip edge to the upper shoulder. This fabric has been highly smoothed above the punctate line. The interior is smoothed, with some brushing in the upper shoulder area.

Paste The paste is moderately well consolidated, with some tendency to crumble. There is a small amount of variable sized feldspar temper in the clay. The exterior is grey brown in colour. The interior is also grey brown, with black staining resembling carbon.

Decoration The lip is undecorated. A line of round punctates encircles the vessel just above the neck juncture. These punctates have left interior bosses which have prominent fingerprint impressions.

Comments This small vessel is unusual in that the potter has attempted to give the vessel an 'S' rim profile, despite the shortness of the rim. Interior staining may be more attributable to liquid boiling than cooking.

Vessel: 53

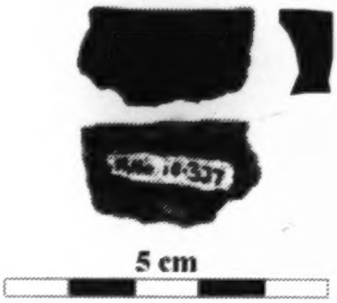
Amount Vessel represented by a single rim sherd.

Form The rim lip is flat with a sharp interior edge or splay. The rim appears to be incurvate, although too little of the vessel is represented to justify calling it an 'S' rim.

Finish The exterior has an obliterated fabric finish. The interior is smoothed.

Paste The paste is moderately well consolidated with a small amount of large and small fragments of dark quartzite temper. The exterior is grey black in colour, while the interior is grey, and lightly encrusted with cooking residue.

Vessel 53



Decoration Wide, loosely wound (babiche?) cwt marks have been vertically impressed around the rim lip exterior edge. A row of deeply impressed punctates has been placed immediately below the lip, creating prominent interior bosses.

Comments This vessel was probably quite small, and may have been a miniature bowl. It strongly resembles vessels from the northeastern plains. It was apparently used for cooking.

Vessel: 54

Amount The vessel is represented by a single long rim sherd.

Form The rim may be vertical with an incipient 'S' rim profile. Unfortunately, not enough rim area is present to properly orient the sherd. The lip is flat with a hint of an interior fillet caused by lip decoration.

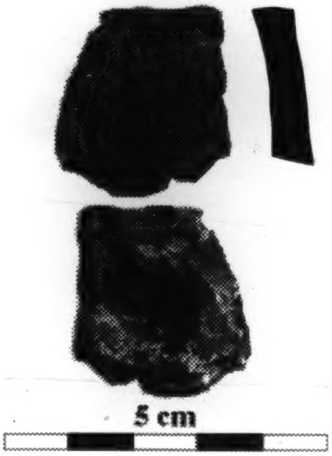
Finish A vertically oriented fabric finish covers the exterior of the vessel from the lip edge. The interior is smooth.

Paste The paste is moderately well consolidated, containing a large amount of medium and fine white feldspar temper. The exterior of the sherd is grey brown in colour with some blackening near the lip. The interior is more grey than brown with some black patches.

Decoration Alternating vertical cwt impressions have been placed on the exterior and interior edge of the lip, giving it a wavy appearance from the top. Tiny but deep punctates have been placed well below the rim edge, leaving minimal bosses.

Comments Alternating lip decoration, plus suggestion of incipient 'S' rim, is unusual. This vessel may have been used for cooking, since a trace of residue is apparent in the punctate area.

Vessel 54



Vessel: 55

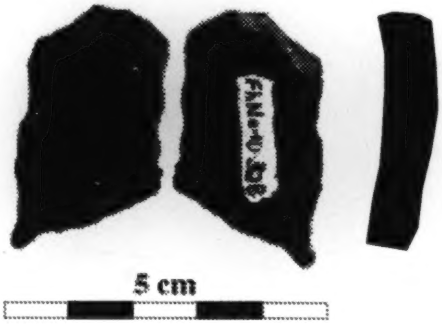
Amount This vessel is represented by a single long rim sherd, in which the lip is almost entirely missing.

Form Rim may be vertically oriented, but its stance cannot be determined. The rim has a rounded lip.

Finish An obliterated fabric finish covers the exterior from below the lip. The interior is smoothed.

Paste The paste is dense and well consolidated. A moderate amount of large and small feldspar fragments make up the temper. The exterior is dark grey in colour, and the interior is dark grey to black, and covered with a thin layer of cooking residue.

Vessel 55



Decoration Obliterated, vertically oriented cwt impressions have been placed on the outer edge of the rim lip. A punctate remnant is present well below the lip.

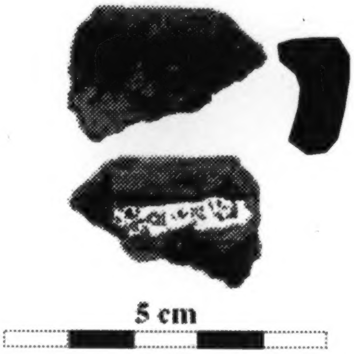
Comments Very little of vessel is present to obtain a proper orientation. However, it was probably a cooking pot.

Vessel: 56

Amount This vessel is represented by a single rim and neck sherd section.

Form The rim is long and straight, with a very slight outward angle. The rim rests on a gently outcurving neck, leading to a straight upper shoulder. The entire profile is thin in comparison to the size of the vessel.

Vessel 56



Finish A prominent, rough fabric finish extends from the exterior lip edge down to below the upper shoulder at least. The interior is unsmoothed in the area of the rim, but smoothed in the upper shoulder

Paste The paste is poorly consolidated, with a tendency to exfoliate on the interior. The paste contains a small amount of finely ground feldspar temper. The exterior and interior of the sherd section are an orange tan colour. The sherd interior paste is grey in colour.

Decoration The rim lip appears to be undecorated, except for a small indent on the outer edge, caused by a fabric knot. A line of punctates is present far down the rim near the neck. They are round and so deeply impressed that they have created bosses which have broken away from the interior wall, leaving round holes in the rim.

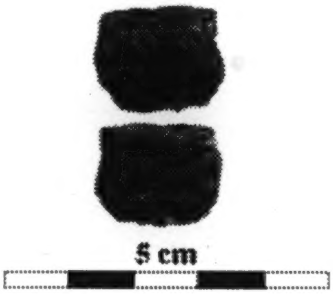
Comments This vessel was found associated with Vessels 5 and 57 in a pot smash area. The vessel appears to have never been used on a fire, and may have been a manufacturing failure.

Vessel: 57

Amount This vessel is represented by a single rim and neck sherd section.

Form The rim is long, straight and vertically oriented, resting on a shallowly outcurving neck. The rim lip is flat and thickened by a fillet on the interior and a slight bulge on the exterior. The rim thins below the lip, but thickens abruptly on the interior in the punctate area. It then thins significantly in the neck area.

Vessel 57



Finish A prominent, knotted fabric finish has been impressed from the exterior lip edge to below the neck. The finish has been largely obliterated. The interior has been smoothed in the lower neck area, and horizontally brushed smooth in the upper rim area above the punctates. The rim lip has been smoothed.

Paste The paste is poorly consolidated, with a tendency to crack and crumble on the interior. The exterior and interior are an orange tan colour. The interior sherd paste is grey.

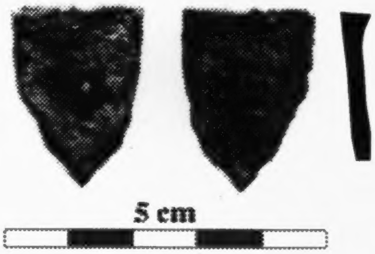
Decoration The rim lip is undecorated, except for the odd knot impression present on the outer lip edge. A line of deeply impressed, round punctates has been impressed about midway between the neck and the rim lip. These punctates have produced large, bulbous bosses on the interior, which bear faint fingerprint impressions. Several bosses have been cracked, forming holes in the rim.

Comments	This vessel section was found associated with Vessels 5 and 56 in a pot smash. The vessel was never used for cooking or general heating and may have been a firing failure. In fact, all three vessels bear a striking resemblance in paste characteristics.

Vessel: 58

Amount	Vessel is represented by a single split rim sherd.
Form	Single sherd is split, but the upper portion of the rim appears to be straight. T lip is flat, with a possible exterior fillet.
Finish	The exterior is fabric impressed. The interior has been exfoliated.
Paste	The paste is very poor with variable sized pieces of quartz and felspar temper, protruding onto the exterior surface. The exterior is a light tan colour, as is the exfoliated interior.
Decoration	The rim lip appears to have been roughened. No punctates are visible.
Comments	There is insufficient sherd available for detailed interpretation.

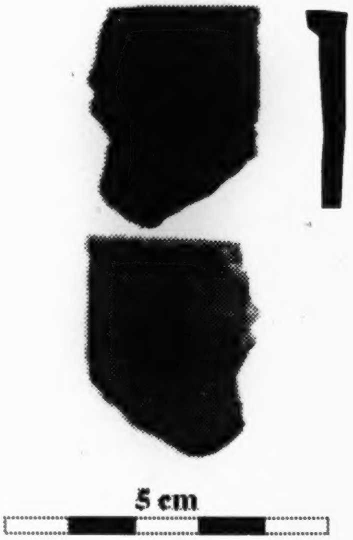
Vessel 58



Vessel: 59

Amount	Vessel is represented by a single rim sherd.
Form	The sherd is vertically oriented, with a very thin profile. The lip is flat and smooth, with a strip of clay applied to the interior edge to give it a fillet. The exterior lip bulges outward a bit.
Finish	A fabric finish covers the exterior of the sherd from below the rim lip down to the limit of the sherd. The interior has been horizontally smoothed.
Paste	The paste is well consolidated with a moderate amount of large and small white feldspar temper fragments. The exterior is grey brown in colour; the interior is a lighter brown.
Decoration	The lip is smooth and undecorated. There is no trace of a punctate, although there is a fair amount of rim represented.
Comments	This vessel is unusual in the thinness of its profile, lack of decoration on the lip and possible lack of punctates. It does not appear to have been used for cooking.

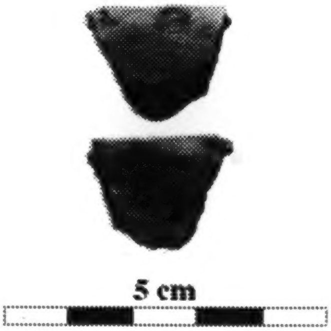
Vessel 59



Vessel: 60

Amount	Vessel is represented by a single tiny rim sherd.
Form	Sherd lip is rounded, particularly on the inner corner. The exterior lip is slightly splayed.
Finish	The sherd exterior is covered with an obliterated fabric impression. The interior has been horizontally smoothed.
Paste	The past is moderately consolidated, containing a small amount of dark quartzite and the occasional white limestone temper fragment. The sherd exterior and interior are orange brown in colour; the paste interior is grey.
Decoration	The rim lip has been notched from the centre of the brim to the interior with vertically oriented, wide cwt impressions. There is no trace of a punctate.
Comments	Sherd is too small to interpret, other than to note that interior notching is not common on Bushfield West.

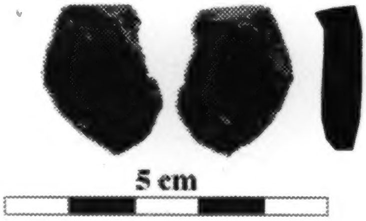
Vessel 60



Vessel: 61

Amount	The vessel is represented by a single tiny rim sherd.
Form	The sherd has a flat lip with a sharp interior lip edge resembling a fillet.
Finish	The sherd is smoothed on the exterior and interior. Both sides show evidence of horizontal brushing.
Paste	The paste is laminated, but well consolidated. There is an abundance of white feldspar temper in the clay. The exterior of the sherd is grey brown; the opposite side is grey a trace of dark staining.
Decoration	The lip is smoothed. No punctates are apparent.
Comments	There are insufficient data available to characterize this vessel.

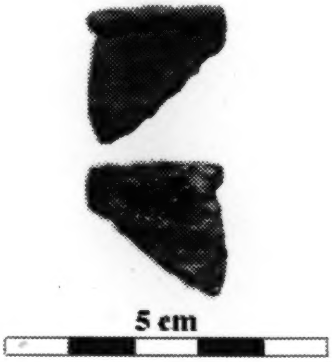
Vessel 61



Vessel: 62

Amount	This vessel is represented by two tiny split rim sherd fragments.
Form	The rim lip is flat and extends over the exterior forming a fillet.
Finish	The exterior is fabric finished. The interior is missing.
Paste	The exterior of the sherd is grey in colour, with some faint carbon staining. The clay is very poorly tempered.
Decoration	The lip is smooth. No punctates are visible.
Comments	This vessel is too poorly represented to interpret. One of the rim fragments appears to have been oxidized in a fire.

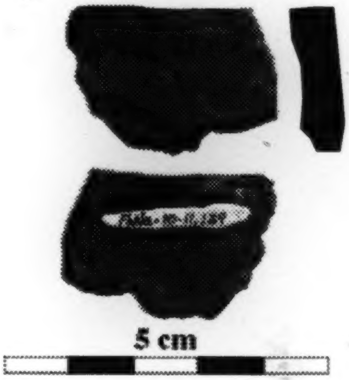
Vessel 62



Vessel: 63

Amount	This vessel is represented by a single small rim sherd.
Form	The rim is vertically oriented. The lip is slightly rounded; the inner corner bulges out a trace. The profile from the lip tapers in slightly then thickens in the punctate area.
Finish	The exterior of the sherd is covered with a highly smoothed, nearly obliterated fabric impression. The interior has been smoothed.
Paste	The paste is moderately well consolidated, containing a small amount of temper. The exterior and interior sides of the sherd are tan coloured, with a greyish stain in the lip area.
Decoration	The exterior lip has been impressed with short cwt indents, at an irregular spacing. Traces of two widely spaced punctates are present. The have been pressed deeply into the rim, forming interior bosses which bear fingerprint impressions.
Comments	There is not much here to interpret. The staining may be due to boiling use, or may be related to soil conditions in which the sherd was recovered.

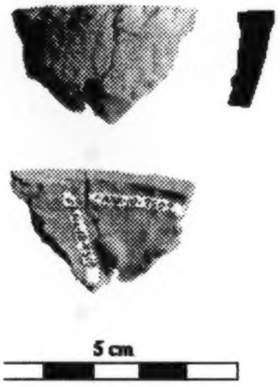
Vessel 63



Vessel: 64 Vessel number not used

Vessel: 65

Amount Vessel is represented by two small conjoined rim sherds.



Vessel 65

Form The rim is short, slightly curved and slopes outward. The rim lip is flattened with a trace of an interior fillet.

Finish An obliterated fabric finish covers the exterior of the vessel below the lip. The interior is smooth with some striation lines above the bosses.

Paste The paste is only moderately well consolidated with a tendency to crack on the interior. A small amount of feldspar temper is present. The exterior is red orange in colour, as is the interior.

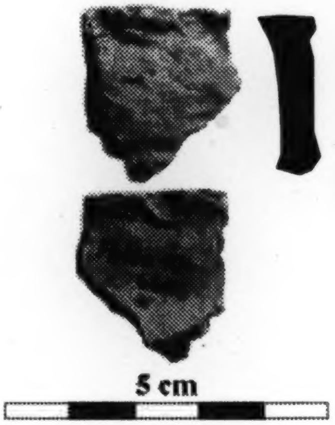
Decoration Vessel rim has a flattened lip with exterior wedgelike notches . A single punctate is present well below the lip, leaving a poorly formed interior boss.

Comments The smallness of the vessel sherds and the form suggests that the vessel may have been a miniature, perhaps a bowl. Alternatively, the profile may also represent a larger 'S' rim vessel. In any case the vessel was not used for cooking or boiling.

Vessel: 66

Amount This vessel is represented by a few fragmented rim sherds.

Vessel 66



Form The rim has a visible incipient 'S' profile. Orientation can only be estimated because of small sherd size, but the rim appears to be nearly vertical. The rim lip has an interior and an exterior fillet.

Finish The exterior of the sherds is fabric finished. The interior is smoothed.

Paste The vessel paste is poorly consolidated, with a tendency to exfoliate. A small quantity of temper is present in the paste, represented by large and small pieces of dark coloured quartzite and some lighter feldspar fragments. The vessel exterior is grey in colour, with some sherds blackened by firing. The vessel interior is a lighter tan colour with some carbon stains.

Decoration The vessel rim has a flattened lip with diagonal cwt impressions placed alternately on the inner and outer corners. Punctates are found on the interior of the vessel remnants with corresponding bosses on the exterior.

Comments Alternating indents on the lip and reverse punctates are aberrant for the Bushfield West collection and are replicated on Vessel 48, found nearby. The two vessel remnants may in fact represent a single vessel; however, sherd thicknesses and rim profile vary significantly between the two and they do not crossmend in any manner. Use cannot be interpreted.

Vessel: 67

Amount This vessel is represented by a single rim sherd.

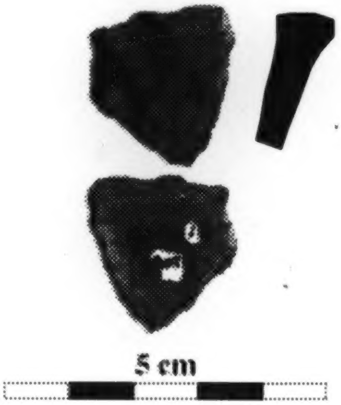
Form The rim flares outward and has a flat lip with a sharp interior fillet formed by applying and smoothing a small strip of clay to the lip inner edge. The rim may be slightly incurvate as well.

Finish The exterior has a smoothed fabric finish below the lip. The interior is smoothed.

Paste The paste is well consolidated with a small amount of finely ground dark quartzite temper. The exterior is tan coloured but stained black while the interior is tan grey with faint carbon spotting.

Decoration The outer edge of the smooth lip has been obliquely impressed from right to left going down with wide cwt impressions. No punctates are visible, possibly because of the small size of the sherd.

Vessel 67



Comments It appears that this vessel may have been a cooking pot, based upon the presence of a black stain on the exterior of the sherd, and on the lip. This may be a thin layer of cooking residue.

Vessel: 68

Amount This vessel is represented by a single small rim sherd.

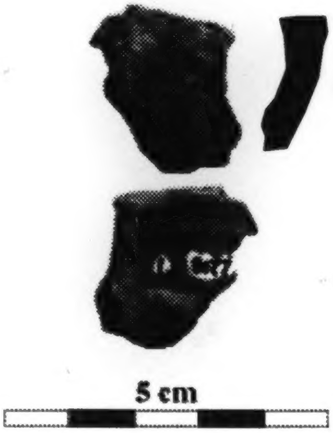
Form The rim flares outward. It has a flat lip with a trace of an interior fillet.

Finish The sherd exterior has a horizontally smoothed fabric finish. The interior has been smoothed.

Paste The paste is moderately consolidated and not very dense. There is only a little feldspar temper present in the paste. The exterior is black and grey in colour, as is the interior.

Decoration A series of vertically oriented cwt impressions have been lightly impressed on the outer corner of the rim lip. A line of deeply impressed punctates are present well below the lip, leaving prominent

Vessel 68



bosses on the interior which bear fingerprints.

Comments A standard Bushfield West vessel. The sherd is too small to interpret use wear, but the black patches on the exterior and interior may represent traces of food residue.

Vessel: 69

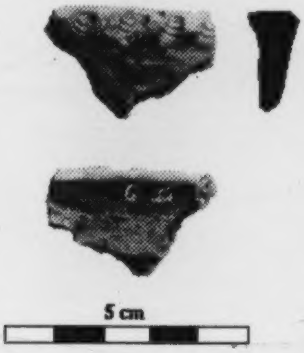
Amount This vessel is represented by a single rim sherd.

Form The sherd has a flat lip with a rounded outer edge. The interior edge is sharp and splayed outward. Sherd orientation appears to be vertical.

Finish The exterior has a smoothed fabric finish. The interior is smoothed.

Paste The paste is well consolidated, with large and small pieces of white feldspar temper mixed in the paste. The exterior and interior are an orange tan colour. The interior paste is grey in colour.

Decoration A series of obliquely oriented (right to left going down) cwt impressions have been placed on the outer edge of the lip. There is no definite trace of a punctate, although the rim remains are very short.



Vessel 69

Comments The well formed lip is typical of Bushfield West. The vessel appears to have been oxidized and may never have been used for cooking.

Vessel: 70

Amount This vessel is represented by a tiny rim sherd.

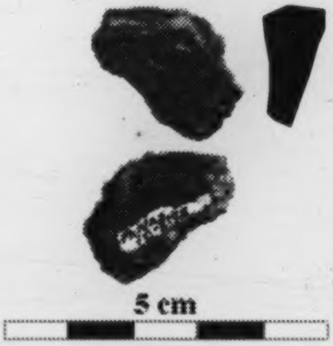
Form The lip is flat with exterior and interior splaying.

Finish The exterior has an obliterated fabric finish. The interior is smoothed.

Paste The paste is moderately consolidated with an abundant quantity of large white feldspar temper fragments. The exterior is a yellow tan colour, the interior and lip are stained grey. The paste interior is grey.

Decoration A series of small vertically oriented cwt impressions have been placed on the outer edge of the lip.

Vessel 70

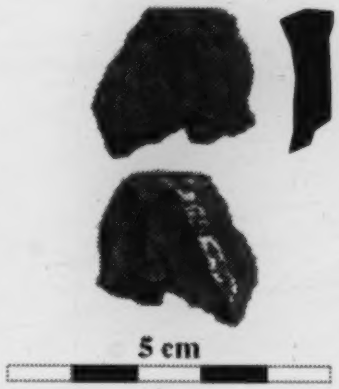


Comments The lip is well formed, and is typical of Bushfield West. There is not enough of the sherd present to determine if punctates were present. The dark stain may be the product of cooking use, although there is no definite trace of cooking residue.

Vessel: 71

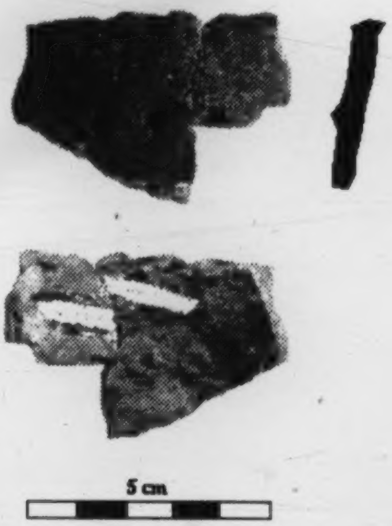
Amount	Vessel is represented by a single fragmented rim sherd.
Form	The rim lip is rounded, with a sharp exterior edge and a rolled interior edge. The rim itself is straight.
Finish	The rim exterior has a fabric finish. The interior is smoothed.
Paste	The paste is moderately consolidated with a small amount of finely ground dark quartzite temper. The exterior is black in colour. The interior is a lighter black, almost grey, with traces of cooking residue present.
Decoration	The outer edge of the lip has been impressed with a wedge shaped object to the centre of the brim, giving it a notched appearance. A square punctate is present below the upper rim.
Comments	Unwrapped notched lip decoration is a little unusual for Bushfield West, but otherwise the vessel is pretty standard. It was apparently used for cooking.

Vessel 71



Vessel: 72

Amount	This vessel is represented by two crossmended rim sherds which do not quite extend down to the vessel neck, but comprise approximately 10% of the vessel circumference.
Form	The rim is slightly outflaring, with a pointed lip caused by lip decoration. The profile is thin at the lip, gradually thickening as the neck area is approached.
Finish	The vessel exterior is covered with a smoothed and horizontally brushed fabric finish from the lip down. The interior is slightly roughened with brushing just above the neck area.
Paste	The paste is moderately well consolidated with some cracking apparent on the exterior and interior. The paste is tempered with a small amount of dark feldspar temper and possibly some sand. The exterior is grey black in colour. The interior is more grey, and bears a heavy encrustation of food residue above the punctate line.
Decoration	The lip is rather crudely decorated from the interior edge across the brim to the exterior with uneven notching or pinch-



Vessel 72

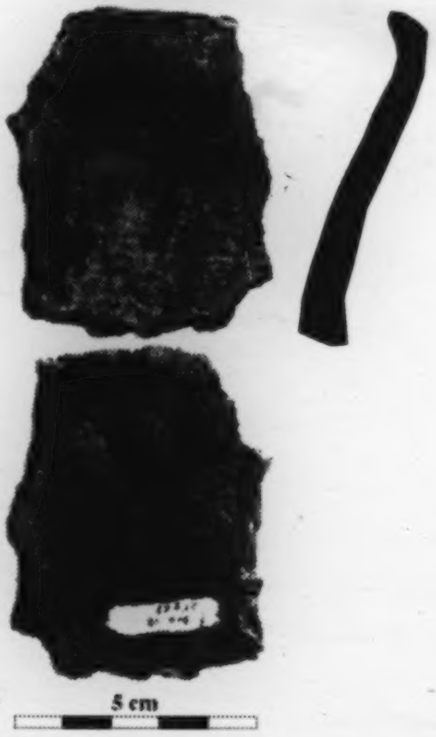
ing. This gives the outer edge of the lip a sharp edge. A single row of unevenly formed punctates has been deeply impressed below the lip, leaving indistinct bosses which are cracked and poorly formed.

Comments Although the vessel strongly resembles the Bushfield form, the level of craftsmanship is much lower in this vessel than in others from the collection. This was apparently a small cooking pot.

Vessel: 73

Amount This vessel is represented by a large rim sherd which extends to just below the neck.

Vessel 73



Form Although there is little lip area available to obtain an orientation, a partial crossmend with a non-conjoining sherd aids in obtaining the orientation. The vessel rim appears to angle outward. The lip is flat and thin but has a very pronounced flare to the interior which gives it more surface area. The rim is long and thin, leading up to a moderately curving and somewhat thickened neck

Finish The exterior from the edge of the lip down is covered with smooth fabric impressions. The interior is smooth.

Paste The paste is dense and well consolidated, containing a small amount of feldspar temper. The exterior is grey in colour, with black patches of carbon encrustation, especially around the punctates. The interior is black, with heavy deposits of cooking residue present.

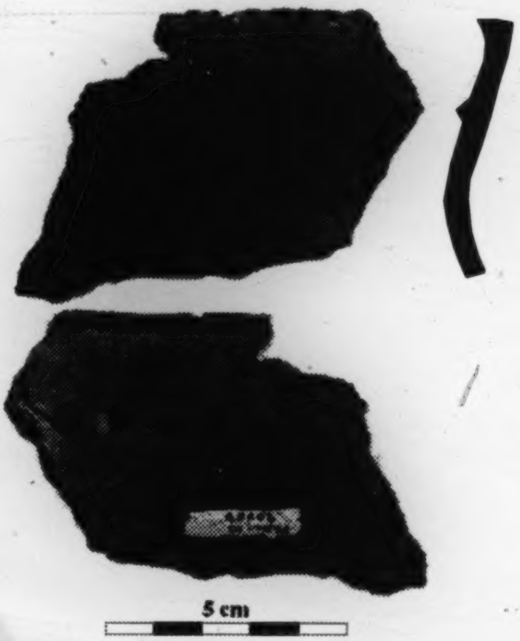
Decoration The inflaring lip is lightly impressed with slightly diagonal (right to left moving outward), very wide cwt impressions, appearing more as stamps than impressions. Located directly below the lip is a single row of large, shallowly impressed, closely spaced punctates. These punctates have left broad, prominent bosses on the interior, which bear well formed fingerprints.

Comments This vessel is a little unusual in that the lip is rolled inward to create a pronounced flare, giving it a very plains-like appearance. This vessel appears to have been a large, heavy-duty cooking pot.

Vessel: 74

Amount This vessel is represented by a large section of rim, neck and upper shoulder.

Vessel 74



Form The vessel has a flat, thin lip with an interior fillet which sharpens the interior edge. The rim is long and thin, with a slight outward flare and a barely perceptible bulge which gives the suggestion of an incipient 'S' rim. The neck is moderately curved.

Finish A prominent knotted fabric finish covers the vessel exterior from the rim lip down to below the neck. The interior is highly smoothed and appears to be possibly floated.

Paste The paste is dense, well consolidated and tempered with a small amount of white feldspar temper. The vessel exterior is grey brown in colour with traces of carbon stain in the neck area. The interior is a lighter grey and unstained.

Decoration The rim lip is smooth, with an intermittently occurring incised line running parallel with the rim circumference. The outer corner of the lip is decorated with tiny vertically oriented cwt impressions which may contribute to the appearance of the incising. A single row of tiny, deeply impressed and very round punctates appears at about the midpoint between the rim lip and neck, leaving small but very prominent interior bosses with fingerprints.

Comments This vessel is very well made and fits well within the Bushfield collection. The fabric is clearly defined, suggesting a Grass River type of finish. Although the vessel was very well made, and appears to have been stained by heating, it bears no cooking residue. It was perhaps a water boiling vessel.

Vessel: 75

Amount This vessel is represented by a large rim and neck sherd. The neck area is only partially present.

Form The rim is long and oriented at an outward angle, resting on a sharply outcurving neck. The vessel lip is slightly rounded and thickened. Below the lip the profile thins, becoming quite thin below the neck juncture.

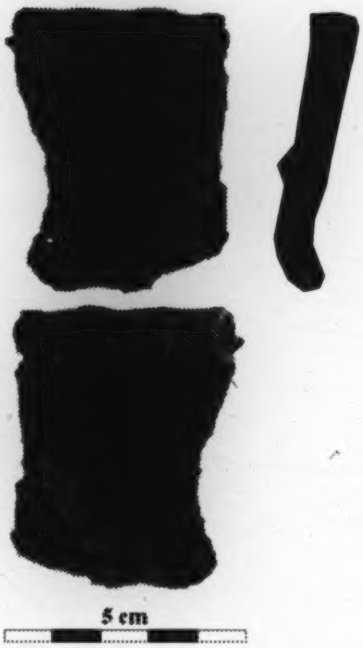
Finish The exterior of the vessel is covered with a fabric impression starting at the outer edge of the rim lip. There has been some smoothing in the neck area. The interior has been smoothed, particularly in the upper rim area.

Paste The paste is dense and well consolidated, containing a moderate amount of dark and light quartzite temper. The exterior is a greyish tan colour; the interior is darker, primarily due to an extensive covering of cooking residue, especially in the region of the punctate bosses.

Decoration Coarse cwt impressions decorate the outer corner of the rim lip. A single row of widely spaced round punctates is deeply impressed slightly below the midpoint of the rim lip and the neck, leaving well-formed bosses with barely perceptible fingerprints.

Comments This is a standard Bushfield form, characteristic of the collection. It was probably a well used cooking vessel.

Vessel 75



Vessel: 76

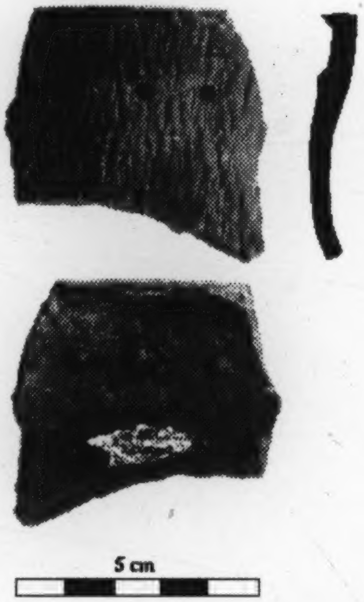
Amount This vessel is represented by a section of rim, neck and upper shoulder.

Form The lip is flat, with a very pronounced inner flare which sharpens the interior edge. The rim is long, angling slightly outward, leaning inward below the lip before straightening at the neck, giving the vessel a slightly 'S' rim appearance. The neck is shallowly outcurving.

Finish A prominent vertically oriented fabric finish extends from the interior lip edge, across the brim, and over onto the vessel exterior to below the neck. The interior is smoothed, with some horizontal brushing at the neck.

Paste The paste is dense and well consolidated, containing a very small amount of finely ground quartzite temper. The exterior is brown in colour, with black patches of carbon encrustation in the vicinity of the lip and around the neck. The interior is blackened with carbon encrustation and food residue, particularly around the punctates.

Decoration Apart from fabric impressions, the vessel lip



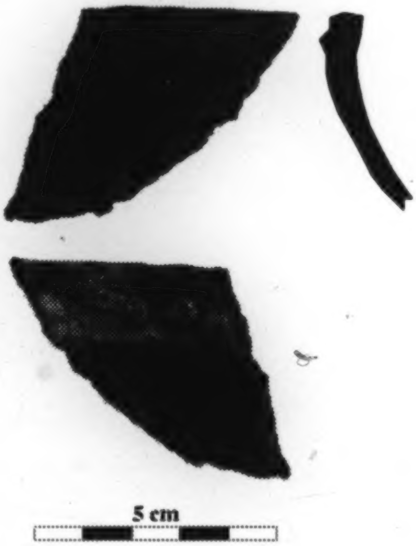
Vessel 76

is undecorated. A single row of small, widely spaced punctates encircles the rim midway between the rim lip and the neck, just below where the rim appears to bulge outward. These punctates have created small but prominent interior bosses which bear obliterated fingerprint traces.

Comments The vertical fabric finish is unusual for the Bushfield collection, resembling the finish found at the Aschkibokahn site in west central Manitoba. This vessel resembles Vessel 74, except that it was obviously a well used cooking vessel.

Vessel: 77

Amount This vessel is represented by a small section of rim, neck and upper shoulder.



Vessel 77

Form The vessel lip is slightly rounded, and rests on a very short, slightly outflaring rim. The interior of the rim shows a sharp neck angle which is not apparent on the exterior of the vessel. The upper shoulder appears to be quite long.

Finish An obliterated fabric finish covers the exterior of the vessel from the rim to the upper shoulder. The interior has been partially smoothed, but appears rough.

Paste The paste is well consolidated with abundant large and small white feldspar temper fragments. The vessel exterior is greyish brown; the interior is a light tan colour with some darker staining near the lip and on the upper shoulder.

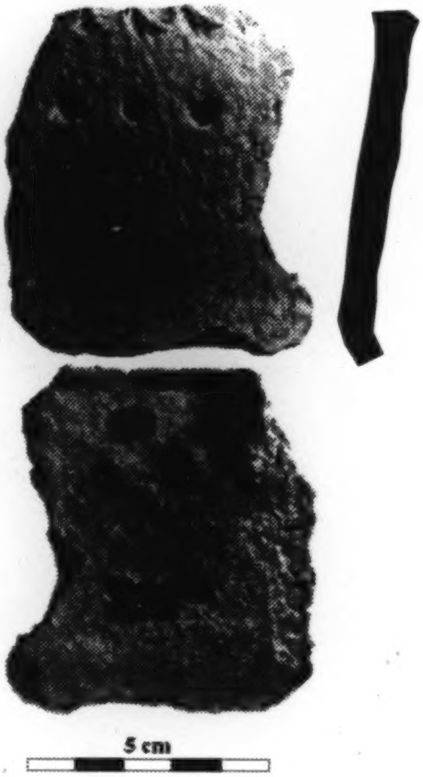
Decoration The lip is decorated with tiny cwt impressions on the exterior and interior. The impressions appear to parallel each other, and also seem to correspond in spacing to a line of round punctates which appear just above the neck. The lip impressions angle from right to left going down on the exterior, and from left to right going down on the interior. The punctate line is slightly wavy, and has created a line of somewhat irregularly formed though prominent bosses on the interior.

Comments The form and decoration of this vessel is not standard for Bushfield West. It would be more appropriate farther east in the Clearwater Lake region of Manitoba. Although stained on the interior, and fire blackened on the exterior, this vessel was not extensively used for cooking. It may have been a small water-boiling pot.

Vessel: 78

Amount This vessel is represented by a single large, long rim and neck sherd.

Vessel 78



Form The rim lip is flat with a slight interior fillet giving the inner edge a sharp corner. The rim is very long and vertically oriented. The neck is shallowly angled.

Finish An obliterated fabric finish covers the vessel exterior from the exterior lip edge down to below the neck. The interior is smoothed, although rough in texture.

Paste The paste is moderately consolidated. Crack lines are apparent on the vessel surface, particularly on the interior. The paste is moderately well tempered with large and small fragments of light coloured feldspar. The vessel exterior is a yellow tan colour. The interior is also tan in colour, with some grey staining in the vicinity of the bosses and upper rim.

Decoration The outer corner of the lip has been impressed or pinched with fingertips diagonally from left to right going down. The lip brim is smoothed but undecorated. A single row of round punctates encircles the vessel high up on the rim, leaving low, unevenly formed bosses.

Comments This is a standard high rim Bushfield West vessel. Although darkened on the interior, this blotching may have come about from the initial vessel firing process. The vessel does not appear to have been used on a fire at all. It may have been some sort of storage vessel.

Vessel: 79 Vessel number not in use.

Vessel: 80

Amount This vessel is represented by two crossmended rim sherds with a portion of the neck present.

Form The rim lip is flat with a slight interior splay. The upper rim is vertically oriented but curves in sharply near the neck before curving outward again at the neck. This gives the vessel a pronounced 'S' rim appearance. The rim profile is of uniform thickness down to the neck, which appears to be slightly thickened.

Finish The vessel exterior is smoothed, with horizontal scraping just above the neck. The interior has been horizontally smoothed as well.

Paste The paste is well consolidated, despite the use of only a very small amount of quartzite temper. The exterior of the vessel is a light tan colour, with grey staining in the neck area. The interior is a uniform tan colour. The paste interior, however, is dark grey, suggesting the vessel had been fired in a highly oxidizing atmosphere, both on the exterior and interior.

Decoration The vessel lip brim bears irregularly shaped notches or stamps set at widely spaced intervals. A very wide but shallow uneven impression is present on the interior edge of the rim, possibly representing a quartering decoration. This decoration is so pronounced that it deforms the entire lip, giving the rim a castellated appearance. A single line of round, deeply impressed punctates encircles the rim about midway between the lip and the neck. The punctates have created unevenly formed bosses which bear obliterated fingerprint impressions.

Vessel 80

Comments This vessel is unusual in many respects. It is very reminiscent of plains pottery in its'S' rim profile, possible rim quartering and subsequent castellation, and lack of a fabric finish, . Yet the presence of the single row of punctates is a strong Selkirk motif not found on the plains. The vessel is rather coarsely decorated except for the punctates, which are fairly precisely applied. It suggests a hybrid in which Selkirk potters were trying to mimic a plains vessel yet maintain some of their own important decorative attributes. The vessel was never used for cooking, and probably was not even used on a fire at all. It may have been a storage pot.

Vessel: 81

Amount This vessel is represented by a rim and neck sherd, and part of the upper shoulder.

Form The rim lip is flat with a slight interior fillet. The rim angles slightly outward, is long, and rests on a moderately angled neck.

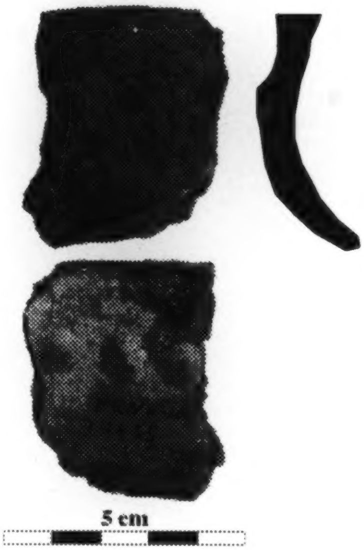
Finish A slightly smoothed fabric finish covers the exterior of the vessel from the interior of the rim edge, over the brim and outer rim edge, to below the neck. The interior is smoothed, although rough in texture and slightly cracked in places.

Paste The paste is well consolidated, containing a moderate amount of large and small feldspar temper fragments. The exterior is dark grey with black staining below the neck. The interior is a light grey/tan colour with a tiny patch of residue in the upper rim area.

Decoration Apart from some burnishing on the outer edge of the brim and a fabric finish, the rim lip is undecorated. A line of deeply impressed, round punctates encircles the vessel midway between the rim lip and the neck. The punctates have created prominent interior bosses with fingerprint traces.

Comments Although this vessel bears no lip decoration, the form and punctate row are standard for Bushfield West. The fabric may resemble that of Grass River. Although there is possibly some cooking residue on the vessel, it does not appear to have been heavily used for cooking. It appears to have been used on a fire, however, and may have been reserved for boiling water.

Vessel 81



Vessel: 82

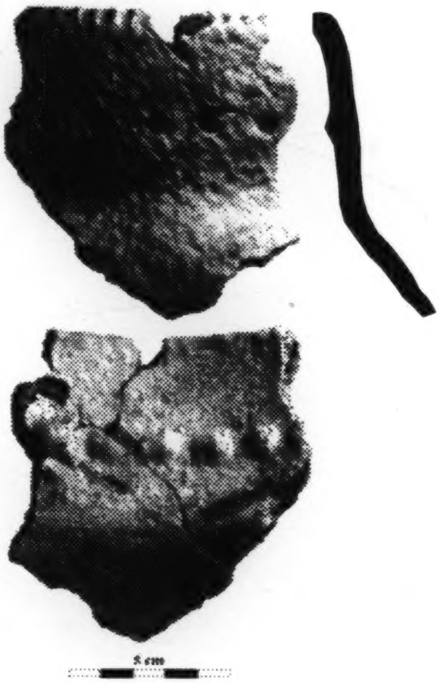
Amount This vessel is represented by a large section of rim, neck and upper shoulder.

Form The rim lip is rounded (primarily due to lip decoration) and is very slightly filleted on the interior. The rim is quite long and vertically oriented, resting on a moderately outcurving and slightly thickened neck, which leads to an apparently long thin upper shoulder. The vessel appears to be quite large, and may have a very shallow 'S' rim, since the upper portion flares inward slightly.

Finish A fabric finish covers the area above the neck. Below the neck the fabric is less prominent but has a vertical orientation. The interior is smooth, although rough in texture.

Paste The paste is moderately consolidated and contains a moderate amount of white feldspar temper. The exterior is tan in colour with some dark staining near the shoulder. The interior is a tan colour, with a lot of surface temper present, perhaps suggesting that the interior was not completely paddled during manufacture.

Decoration A series of vertically oriented cwt impressions is present on the outer corner of the rim lip. The impres-



Vessel 82

sions have been impressed deeply, to the centre of the brim. A single row of circular punctates encircles the vessel midway between the lip and the neck, creating wide, well formed interior bosses which have obliterated fingerprint impressions.

Comments This large vessel is typical of the Bushfield West collection. It does not appear to have been used on a fire, and may have been used for storage rather than boiling.

Vessel: 83

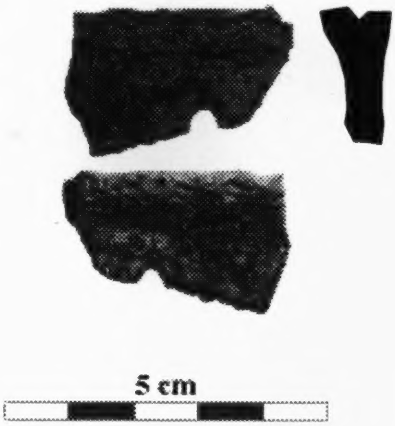
Amount This vessel is represented by a single small rim sherd.

Form The vessel lip is wide and flat with an interior flare, probably caused by lip decoration. The rim, though short, probably bulges outward before turning inward at the neck, giving the vessel an 'S' rim profile.

Finish A smoothed fabric finish covers the exterior of the rim sherd from the outer edge of the lip down. The interior is smoothed, with brushing apparent just below the lip, plus some surface cracking.

Paste The paste is only moderately well consolidated, containing an abundant amount of coarse ground feldspar temper. The exterior is grey in colour; the interior a light yellow tan.

Vessel 83



Decoration The wide lip bears a twisted cord line running parallel with the rim down the brim. On the outer lip corner a series of tiny cwt impressions are present, placed at an angle from right to left going down. The inner corner of the lip bears similar cwt impressions, oriented vertically. An apparent wavy, widely spaced and deeply impressed line of round punctates is present below the lip.

Comments The lip treatment on this vessel is unusually complicated and is not standard for Bushfield West. Although this vessel appears to have been used on a fire, it does not bear cooking residue. It may have been used to boil water.

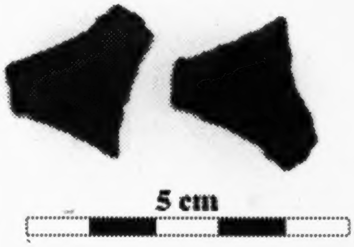
Vessel: 84

Amount This vessel is represented by a neck section only.

Form The vessel is quite small (possibly a miniature) with a moderately curving neck area.

Finish A fabric finish covers the neck area. The interior has been smoothed, very nearly burnished.

Vessel 84



Paste The paste is well consolidated containing a tiny amount of sand temper. The exterior is a yellow tan colour; the interior is shiny black.

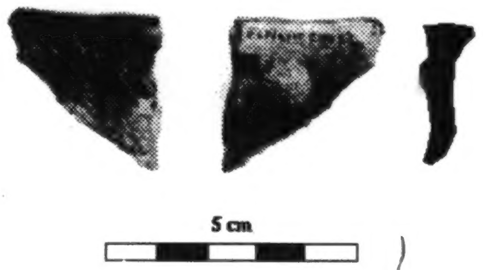
Decoration This vessel has two or more rows of tiny punctates present near the neck, which have produced small but pronounced interior bosses with visible but incomplete fingerprint impressions.

Comments This sherd is unusual. It is included as a vessel because of the multiple line of punctates present.

Vessel: 85 Vessel number not used.

Vessel: 86

Amount This vessel is represented by a single rim sherd.



Vessel 86

Form The rim lip is splayed on the exterior and interior, possibly as a result of the application of lip decoration. Below the lip the rim is quite thin.

Finish A coarse fabric finish covers the sherd exterior below the lip. The interior is smooth.

Paste The paste is moderately well consolidated, with a tendency to exfoliate on the exterior. It contains a small amount of dark quartzite temper. The exterior is grey with carbon encrustation. The interior is also grey, with a heavy deposit of cooking residue below the punctate row.

Decoration The splayed lip has been decorated with a line of deep circular stamps or punctates which traverse the rim brim. Immediately below the rim is a line of deeply impressed punctates which have created large bosses on the vessel interior.

Comments Lip punctates are unusual for Bushfield West, but not uncommon on Clearwater Lake Punctate vessels. This vessel was used for cooking.

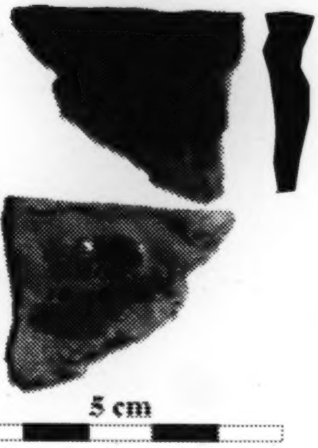
Vessel: 87

Amount This vessel consists of a single rim sherd which just approaches the neck.

Form The rim lip is flat with a poorly formed interior fillet. The rim is vertically oriented with a slight 'S' rim curve down to the neck.

Finish An obliterated fabric finish covers the exterior of the sherd. The interior is smoothed.

Vessel 87



Paste The paste is moderately consolidated but minimally tempered with the odd quartzite fragment. There is some exterior cracking. The exterior is tan coloured with black carbon staining, especially near the rim lip. The interior is a yellow tan colour.

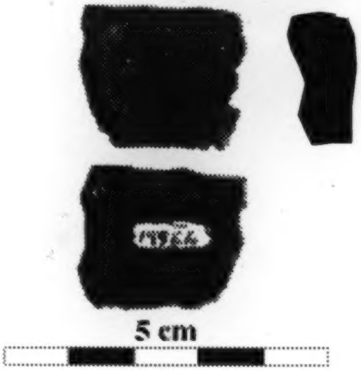
Decoration The lip is smooth except for a single oblique (right interior to left exterior) elongated finger or stick impression which penetrates the interior edge of the lip and causes the clay to bulge out. This may be a quartering mark. A single row of punctates encircles the vessel just below the rim leaving low interior bosses.

Comments The punctates on this incipient 'S' rim vessel are located very close to the rim lip and are thus not usual to the Bushfield collection. The quartering mark is also unusual. Although there is evidence that this vessel was fire blackened, it was apparently not used for cooking.

Vessel: 88

Amount This vessel is represented by a single tiny rim sherd.

Vessel 88



Form The rim lip has an interior splay. The rim profile is quite thick but cut off well before the neck area. It appears to angle outward, but there is so little lip present that the true profile orientation can only be estimated.

Finish The exterior of the sherd has a smoothed fabric impression, which is almost obliterated. The interior has been roughened.

Paste The paste is well consolidated and dense. It is unevenly tempered with a moderate amount of light feldspar temper. The exterior and interior of the vessel are black. There is a trace of cooking residue on the interior, below the boss line.

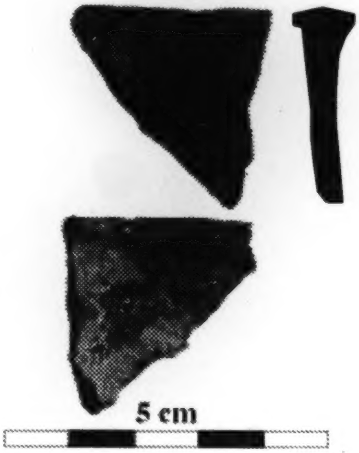
Decoration The lip is smooth (almost burnished) with a single square notch impressed on the inner lip edge. A single row of small deeply impressed punctates are present just below the rim lip, creating minimal bosses on the interior.

Comments Although very poorly represented, this vessel is unusual for Bushfield West. It was probably a small cooking vessel.

Vessel: 89

Amount This vessel is represented by two small rim sherds, one which extends to the neck.

Vessel 89



Form The lip is flat with a slight exterior splay and a prominent interior fillet. The rim appears to be vertically oriented, resting on a weakly outcurving neck. Unfortunately, there is too little lip present to properly orient the vessel profile.

Finish A smoothed fabric finish covers the vessel exterior. Below the rim lip the fabric appears vertically woven. The interior is smooth, almost floated, with some surface cracking.

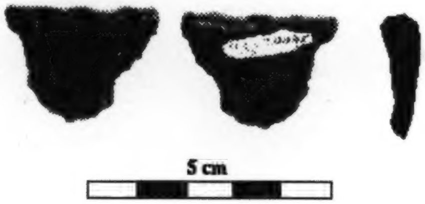
Paste The paste is well consolidated, with a moderate amount of variable sized fragments of light feldspar temper. The exterior is black in colour, with occasional patches of grey. The interior is light grey in colour with occasional patches of cooking residue.

Decoration The rim lip exterior bears a series of elongated vertical notches which appear to have been formed by fingernails. The lip brim is smooth.

Comments Despite the presence of two rim sherds, there is no trace of punctates or bosses. They are either widely spaced, or nonexistent, which would make this vessel unusual for the Bushfield West collection. This vessel may have been used for cooking, but not extensively. It was probably more commonly used for boiling water.

Vessel: 90

Amount This vessel is represented by a single small rim sherd.



Vessel 90

Form The rim lip is rounded, with a slight interior splay. The rim profile is slightly excurvate and may represent an incipient 'S' rim. The profile thins appreciably below the lip.

Finish An obliterated fabric finish covers the exterior of the sherd. The interior appears to be smoothed. The lip is burnished.

Paste The paste is well consolidated, containing a moderate amount of large and small feldspar temper particles. The exterior is black. The interior is black with a heavy encrustation of cooking residue deposited below the lip.

Decoration A series of vertically oriented cwt impressions is present on the outer corner of the rim lip, pushed in to nearly the centre of the brim.

Comments Not enough of the vessel is present to determine if it has punctates. It was a small cooking vessel.

Vessel: 91

Amount Vessel is represented by a single large rim sherd which does not quite extend down to the vessel neck.

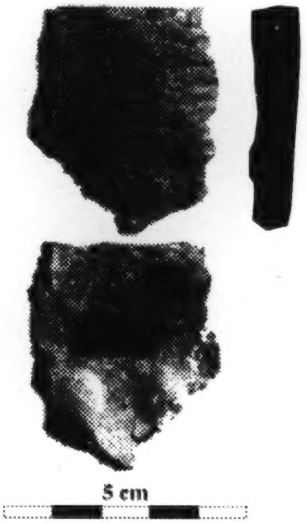
Form The lip is flat, and squared off on the interior. The rim angles outward. It has a uniformly thick profile from the lip to near the neck.

Finish A smooth, horizontally oriented fabric finish covers the sherd exterior. The interior is smoothed with some surface cracking.

Paste The paste is dense and well consolidated, containing a small amount of light feldspar temper. The exterior is black, and encrusted with cooking residue. The interior is a dark tan colour.

Decoration The outer corner of the rim lip is decorated by wide spaced, shallow and indistinct notches or finger pinches. A single row of wide spaced, deeply impressed round punctates is located well down the rim, forming low, wide bosses on the interior, which have faint fingerprint impressions.

Vessel 91



Comments This was apparently a large cooking vessel, which appears to fit in well with most of the Bushfield West collection.

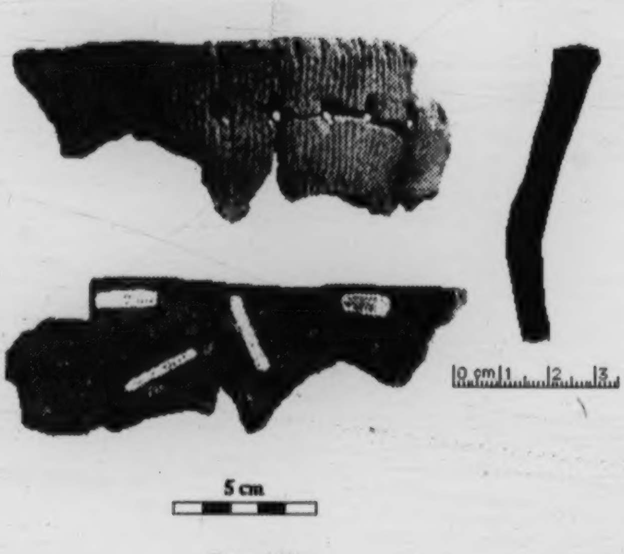
Vessel: 92

Amount Only the rim and neck portion of this vessel has been reconstructed, although over 50% of the rim is present.

Form The rim is long and straight, with a distinct outwardly angled orientation. The neck is shallowly angled on the exterior, although the interior angle appears to be more prominent due to bulging. The vessel construction is more robust than most vessels from Bushfield West, in that the rim does not taper as it approaches the neck, and there is no substantial thinning of the vessel wall below the neck. The vessel profile appears to be uniform in thickness.

Finish A fine vertical cord fabric finish has been impressed on the vessel exterior from the neck to the outer edge of the rim lip. The fabric finish is less pronounced below the neck as far as the vessel is represented. The interior finish is smoothed.

Paste The paste is unusually dense and very finely tempered. There may be some shell used as temper although most appears to be crushed quartzite. The exterior of the vessel is greyish black in colour with a reddish tinge, suggesting that it may have been burned. The interior has a moderate to heavy encrustation of cooking residue over all parts of the represented vessel.



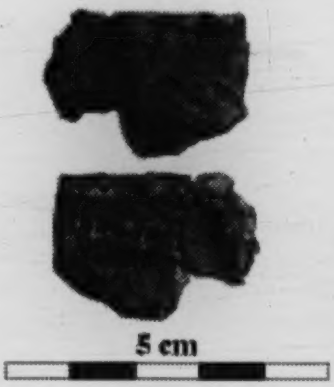
Vessel 92

Decoration The vessel rim has a flattened lip with diagonal stick indentations on the outer edge. Oblong, upwardly-impressed punctates have been regularly spaced midway between the rim lip and the neck. The punctates have produced very minimal bosses. A single notch resembling a thumb impression has been placed on one section of the rim. This may be a quartering decoration, but was probably just accidental, since the mark appears nowhere else on the rim.

Comments Interior encrustation and exterior blackening suggest that this vessel was a well-used, heavy duty cooking pot. Its robust nature is unusual for the Bushfield West collection, as is the dense paste and vertical corded finish.

Vessel: 93

Amount This vessel is represented by two tiny joined rim sherds, which do not extend to the neck.



Vessel 93

Form There is insufficient rim available to determine the orientation of the vessel fragment, but it appears that the rim may angle outward. The rim is relatively thin and has a pronounced outward flare at the lip, with a lesser inward flare.

Finish The sherd exterior is covered with an obliterated fabric finish, up to and including the rim lip. The interior has been smoothed.

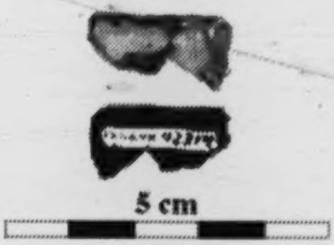
Paste Sherd paste is grey in colour, although the interior and exterior face are orange and appear oxidized. A moderate amount of white feldspar temper is present in the paste.

Decoration The rim lip is flat and deeply impressed on the exterior by closely-spaced notches which give the lip a serrated appearance. These notches may be "piceated", that is, impressed with a tool much resembling the twig of a spruce tree. No punctates are visible, perhaps because of the incomplete nature of the rim.

Comments Piceation is a decorative form found in pottery from Southern Indian Lake in Manitoba. It is not found on any other vessel from Bushfield West. This vessel does not appear to have been used on a fire.

Vessel: 94

Amount The vessel is represented by the upper portion of two conjoined rim sherds.


Vessel 94

Form Due to the incompleteness of the sherds no profile is obtainable.

Finish Both the exterior and interior of these tiny rim sherds have been smoothed.

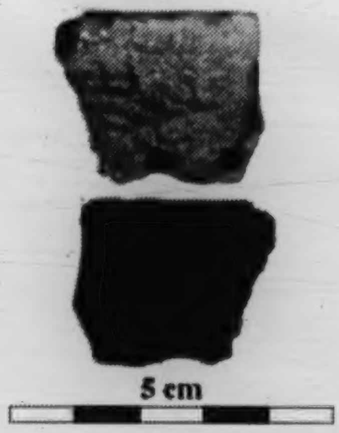
Paste The paste is friable and perhaps has a tendency to exfoliate on the exterior. The temper has been moderately to finely ground and is composed of white feldspar.

Decoration A stamp or shallow punctate has been impressed at an angle on the lip brim. The rectangular form of the punctate is oriented perpendicular rather than parallel to the edge of the lip.

Comments Apart from the presence of the lip stamp or punctate, this vessel is poorly represented and is difficult to compare with other vessels.

Vessel: 95

Amount This vessel is represented by a single small rim sherd.


Vessel 95

Form The rim is oriented in a near vertical position, although there is sufficient rim to accurately determine the profile stance. It shows a slight 'S' rim profile. The rim lip is flat, and has a splayed exterior and sharp inner edge.

Finish A smoothed, horizontally oriented fabric finish covers the sherd exterior. The interior is smoothed.

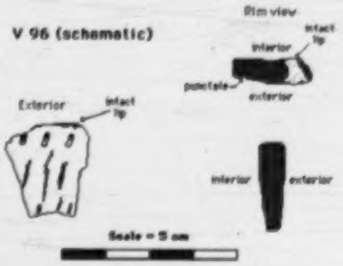
Paste The paste is moderately well consolidated, containing a small amount of light feldspar temper. The exterior is an orange tan colour, while the interior is a grey tan colour. The paste interior is grey.

Decoration A series of long thin twisted cord impressions have been placed obliquely across the lip brim from interior left to exterior right looking down. A single row of deeply impressed punctates is present far down the rim, forming prominent but irregularly shaped interior bosses.

Comments The diagonal lip markings are more common for Saskatchewan Clearwater Lake ceramics, but the vessel fits in with Bushfield West. The vessel was not used for cooking, and may never have been used on a fire.

Vessel: 96

Amount The vessel is represented by a long section of rim sherd, with only a tiny portion of the rim lip present.



Form The form is unusual, because the neck juncture is not present, despite the unusual length of the rim. The lip is thick and rounded, thinning somewhat below the rim.

Finish The exterior of the vessel is covered with a smoothed fabric impression. The interior is smooth.

Paste The paste is moderately well consolidated, containing a moderate quantity of white feldspar temper. The exterior is grey with dark patches of carbon, particularly near the rim. The interior is also grey, but a large section is covered with black deposits of cooking residue, particularly below the lip.

Decoration The lip brim is undecorated. The outer corner of the lip has been decorated with a series of oblique notches angling from right to left going down. A line of very elongated upward penetrating punctates circles the vessel. The punctates are positioned right up against the edge of the rim.

Comments The unusual shape of this rim sherd suggests that it is either a wide bowl, or possibly a plate. If it is a plate it probably strongly resembles the plates from Southern Indian Lake and would be the first known occurrence of such a vessel outside of northern Manitoba. The sherd form suggests that if it was part of an SIL type plate, it would have come from near one of the end points of the ovate vessel rather from the side. Breakage patterns on similar vessels in the SIL area resemble this sherd. Dave Riddle says that the rim lip of and SIL plate is usually thinner and rounder than flat. He doesn't think this vessel is a plate (personal communication 1988). It is possible that the sherd represents the very large outflaring lip of a large pot, but the position of the punctates and the curious twisted form of the profile are at odds with this interpretation. Whatever the vessel was, plate, bowl or pot, it was obviously used for cooking. If it was a plate, it would have been like a frying pan.

Vessel: 97

Amount Vessel is represented by a single small rim sherd.

Form The flat rim lip has an interior fillet and a slight exterior flare. The rim profile appears to be vertical, perhaps leaning outward a bit. There is not enough sherd to orient the profile correctly.

Finish A smooth fabric finish covers the exterior of the sherd. The interior has been smoothed.

Paste The paste is moderately well consolidated, containing a small amount of finely ground quartzite temper. The exterior is grey brown in colour. The interior is a darker brown, with food residue encrustation.

Vessel 97

Decoration The rim lip has widely spaced (approximately 2.5 cm) cwt impressions on the outer corner. Punctate traces are present at the base of the truncated sherd.

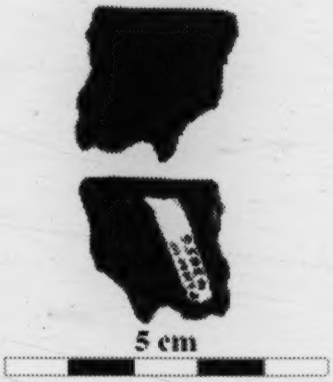
Comments Apart from the unusually wide spacing of the lip decorations, the vessel does not appear to vary significantly from most other vessels in the Bushfield West collection. It was used as a cooking pot.

Vessel: 98

Amount Vessel is represented by a small rim sherd fragment.

Form The lip is flat with an interior fillet, making the interior edge quite sharp. The rim leans outward but curls in slightly at the lip, suggesting a possible incipient 'S' rim profile.

Vessel 98



Finish The exterior of the sherd is covered with a fabric finish. The interior is smoothed.

Paste The paste is well consolidated, containing a moderate amount of dark quartzite temper. The exterior is black and stained with cooking residue. The interior is grey.

Decoration The rim lip is smooth and apparently undecorated. A punctate remnant is present well down the rim, near where the neck would be.

Comments This vessel resembles Vessel 97 but the two sherds do not crossmend, and have differing rim thicknesses. It was probably a cooking pot.

Appendix D

Bushfield West Pottery Vessel Metrics/Provenience

Pages C-2 to C-5: R Height, R Diam, R Angle, R Length, R Circum, R %, Wall Thick, A, C, Mouth Flr, Lip Thick, LL Thick

Pages C-6- to C-9:P Length, P Width, P Depth, P Space, P DBL, S Height, S Diam, S. Thick, S Angle, Neck Diam, Neck Thick, Block Provenience (RS=Reworked Sand; *=Uncertain Context)

Vessel	R Height	R Diam	R Angle	R Length	R Circum	R %	Wall Thick	A	C	Mouth Flr	Lip Thick	LL Thick
1	4.3	20	90	4.3	62.8	15.8	0.5	1.2	9.5	91	0.9	0.8
2	5.8	18	88	5.8	56.4	23.3	0.5	2.3	12	95	0.7	0.6
3	2.4	14.4	92	2.4	45.3	30.2	0.4	3	11.7	94	0.7	0.6
4	3.6	13.9	87	3.6	43.7	29	0.5	2.7	11	95	0.6	0.5
5	3.9	18.2	82	3.8	57.1	26.6	0.6	3	13.5	94	0.9	0.6
6	2.6	22.3	54	3.3	70.2	12.1	0.5	0.8	8.3	49	1	0.8
7	1.8	7.2	84	1.8	22.6	15.1	0.3	0.4	3.3	78	0.6	0.5
8	3.3	17.2	84	3.3	54	33.8	0.4	4.4	15	79	0.6	0.6
9	3.4	12.9	92	3.4	40.7	35.9	0.3	3.7	11.7	95	0.8	0.5
10	1.5	6	85	1.5	18.8	35.8	0.6	1.7	5.4	41	0.3	0.3
11	3.5	16.2	86	3.5	51	19.7	•	1.5	9.4	99	0.9	0.8
12	4	20.9	82	4	65.8	17.2	•	1.5	10.8	98	1.2	0.7
13	4.6	16.6	90	4.6	52.2	46.1	0.4	7.3	16.5	94	0.8	0.8
14	7.5	25.5	69	8	80.2	5.6	•	0.2	4.5	90	0.6	0.6
15	3.9	27.4	85	3.9	86	6.7	•	0.3	5.7	90	0.8	0.6
16	0.7	5.1	90	0.7	15.9	32.4	0.8	1.2	4.3	90	0.5	0.7
17	5.2	8.6	75	5.4	27.2	7.7	•	0.2	2.6	89	0.9	0.7
18	1.3	3.4	89	1.3	10.7	15.6	0.4	0.2	1.6	88	0.4	0.3
19	3.8	15.6	86	3.8	49.1	30.9	•	3.4	12.9	101	0.8	0.6
20	3.3	10.2	85	3.3	32	14.2	0.3	0.5	4.4	132	0.6	0.3
21	3.3	19.2	96	3.3	60.2	18.7	0.4	1.6	10.6	105	0.7	0.6
22	4.2	17.5	81	4.2	55	16.1	•	1.1	8.5	78	1	0.7

Vessel	R Height	R Diam	R Angle	R Length	R Circum	R %	Wall Thick	A	C	Mouth Flr	Lip Thick	LL Thick
23	•	•	•	•	•	•	•	•	•	•	0.5	0.7
24	4.9	22.8	93	4.9	71.7	7.3	•	0.3	5.2	114	0.7	0.5
25	2.1	10.9	85	2.1	34.3	12.3	•	0.4	4.1	90	0.7	0.6
26	4.9	20	74	5.1	62.8	15.8	•	1.2	9.5	99	0.7	0.5
27	2.2	12.1	96	2.2	38.1	26.6	•	2	9	117	0.9	0.7
28	3.5	8.9	102	3.5	28	15.2	•	0.5	4.1	104	0.5	0.4
29	4.1	21.8	83	4.2	68.3	24.2	0.5	3	15	85	0.9	0.6
30	•	•	•	•	•	•	•	•	•	•	0.7	0.6
31	3	•	•	3	•	•	•	•	•	•	1	0.8
32	•	16.8	76.5	2.9	52.9	10.2	•	0.4	5.3	•	1	0.8
33	•	•	•	•	•	•	•	•	•	•	0.8	0.7
34	2.6	11.5	86	2.6	36.3	13.3	•	0.5	4.7	90	0.7	0.6
35	•	•	•	•	•	•	•	•	•	•	0.9	0.8
36	•	•	•	•	•	•	•	•	•	•	0.7	0.6
37	2.5	12.1	89	2.5	38.1	43.9	0.4	4.9	11.9	85	0.6	0.6
38	2.5	9.3	86	2.5	29.3	14.9	•	0.5	4.2	94	0.6	0.5
39	4.3	20	76	4.4	62.8	9	•	0.4	5.6	92	0.7	0.6
40	3.5	9.6	84	3.5	30	22	0.3	1.1	6.1	121	0.5	0.4
41	2.1	9.3	90	2.1	29.3	28.1	0.3	1.7	7.2	93	0.6	0.5
42	6.2	16.7	83	6.2	52.6	11.1	0.4	0.5	5.7	92	0.8	0.6
43	6	9.4	91	6	29.6	26.1	•	1.5	6.9	101	0.8	0.6
44	1.9	12.9	71	2	40.6	19.7	•	1.2	7.5	70	0.5	0.7

Vessel	R Height	R Diam	R Angle	R Length	R Circum	R %	Wall Thick	A	C	Mouth Flr	Lip Thick	LL Thick
45	3.1	24.7	76	3.2	77.7	10.8	•	0.7	8.2	90	0.9	0.6
46	•	•	•	•	•	•	•	•	•	•	0.9	0.6
47	•	•	•	•	•	•	•	•	•	•	0.8	0.6
48	•	•	•	•	•	•	•	•	•	•	0.7	0.5
49	•	•	•	•	•	•	•	•	•	•	0.6	0.6
50	•	•	•	•	•	•	•	•	•	•	0.7	0.7
51	•	•	•	•	•	•	•	•	•	•	0.8	0.7
52	1.9	10.7	87	1.9	33.7	8.7	•	0.2	2.9	90	0.5	0.6
53	•	•	•	•	•	•	•	•	•	•	0.7	0.5
54	•	•	•	•	•	•	•	•	•	•	0.6	0.6
55	•	•	•	•	•	•	•	•	•	•	0.8	0.9
56	4.7	•	•	4.7	•	•	•	•	•	•	0.7	0.5
57	5.1	27.4	92	5.1	86	6.7	•	0.3	5.7	108	0.9	0.6
58	•	•	•	•	•	•	•	•	•	•	•	•
59	•	•	•	•	•	•	•	•	•	•	0.7	0.4
60	•	•	•	•	•	•	•	•	•	•	0.7	0.6
61	•	•	•	•	•	•	•	•	•	•	0.7	0.6
62	•	•	•	•	•	•	•	•	•	•	•	•
63	•	9.3	100	•	29.3	9.4	•	0.2	2.7	104	0.7	0.5
65	•	14.6	76	•	46	7.5	•	0.2	3.4	99	0.7	0.6
66	•	•	•	•	•	•	•	•	•	•	0.8	0.6
67	•	•	•	•	•	•	•	•	•	•	0.9	0.5

Vessel	R Height	R Diam	R Angle	R Length	R Circum	R %	Wall Thick	A	C	Mouth Flr	Lip Thick	LL Thick
68	•	•	•	•	•	•	•	•	•	•	0.7	0.6
69	•	•	•	•	•	•	•	•	•	•	1	0.7
70	•	•	•	•	•	•	•	•	•	•	1.1	0.7
71	•	•	•	•	•	•	•	•	•	•	0.8	0.6
72	•	7.6	80	•	23.9	11.1	•	0.6	4.1	82	0.6	0.5
73	5.7	19.2	71	6	60.4	6.5	•	0.2	3.9	109	1	0.6
74	3.3	13.8	74	3.4	43.4	7.7	•	0.2	3.3	112	0.7	0.5
75	4.6	17.3	79	4.7	54.4	6.9	•	0.2	3.7	90	1	0.8
76	3.1	13.8	80	3.1	43.4	7.7	•	0.2	3.3	128	0.7	0.4
77	1	13.6	82	1	42.8	9.5	•	0.3	4	85	0.7	0.8
78	6.4	16.4	83	6.4	51.5	7	•	0.2	3.6	90	0.9	0.6
80	•	12.5	•	•	39.3	12.8	•	0.5	4.9	83	0.8	0.6
81	2.2	•	•	2.3	•	•	•	•	•	•	0.8	0.6
82	5.7	15.2	100	5.8	47.9	14.7	•	0.8	6.8	123	0.9	0.7
83	•	•	•	•	•	•	•	•	•	•	1	0.6
84	•	•	•	•	•	•	•	•	•	•	•	•
86	•	•	•	•	•	•	•	•	•	•	1	0.6
87	•	6.2	90	•	19.6	11.4	•	0.2	2.2	111	0.7	0.5
88	•	•	•	•	•	•	•	•	•	•	1	0.9
89	•	•	•	•	•	•	•	•	•	•	1	0.4
90	•	7.4	90	•	23.3	10.5	•	0.2	2.4	108	0.8	0.5
91	•	•	•	•	•	•	•	•	•	•	0.9	0.9

Vessel	R Height	R Diam	R Angle	R Length	R Circum	R %	Wall Thick	A	C	Mouth Flr	Lip Thick	LL Thick
92	3.8	20.9	74	4	65.7	20	•	2	12.3	82	1.1	0.9
93	•	•	•	•	•	•	•	•	•	•	0.9	0.5
94	•	•	•	•	•	•	•	•	•	•	0.7	0.6
95	•	•	•	•	•	•	•	•	•	•	0.9	0.7
96	•	•	•	•	•	•	•	•	•	•	0.9	0.8
97	•	•	•	•	•	•	•	•	•	•	0.9	0.6
98	•	•	•	•	•	•	•	•	•	•	0.7	0.5

Vessel	P Length	P Width	P Depth	P Space	P DBL	S Height	S Diam	S. Thick	S Angle	Neck Diam	Neck Thick	Block Prov.
1	0.5	0.5	0.8	1.5	2.7	4.5	25.1	0.6	123	20.4	0.7	3
2	0.7	0.4	0.6	1.1	3.5	4.7	26	0.5	128	18.2	0.7	1
3	0.5	0.5	0.5	1.6	1.8	4.1	19.6	0.6	122	14.8	0.7	2.1
4	0.6	0.5	0.5	1.9	2	3.7	20.7	0.5	134	13.2	0.7	1
5	0.3	0.3	0.5	0.9	1.8	•	25.3	0.7	•	16.4	0.9	5
6	0.5	0.4	0.6	1.6	1.5	5.3	21.7	0.5	106	18.2	1	2.2
7	0.2	0.2	0.4	0.9	1.4	2.5	7.7	0.7	110	7	0.6	17
8	0.8	0.5	0.6	1.2	1.5	7	23.7	0.4	119	16.4	1	3
9	0.4	0.4	0.5	1.5	1.6	2.9	15.2	0.5	125	13.2	0.5	1
10	0.3	0.2	0.2	0.6	1	1.4	6.1	0.7	111	6.7	0.4	2.2
11	0.5	0.4	0.5	2	2.9	•	•	•	•	16.1	0.7	2.1
12	0.5	0.5	0.6	1.7	2.1	•	•	•	•	20.4	0.7	1
13	0.6	0.5	0.9	2	2.9	4.6	21.7	0.6	117	16.9	0.7	RS
14	0.6	0.4	0.6	1.3	2.3	•	•	•	•	19.6	0.7	*3/RS
15	0.5	0.5	0.6	2	2.3	•	•	•	•	23.3	0.8	2.1
16	•	•	•	•	•	1.9	4.5	•	63	•	•	RS
17	0.5	0.4	0.8	1.5	3.1	•	•	•	•	9.5	0.9	1
18	•	•	•	•	•	0.6	4.5	0.5	97	4.3	0.4	2.2
19	0.4	0.3	0.5	1.6	1.5	2.9	17.7	•	111	15.3	0.5	2.1
20	0.4	0.3	0.3	1.6	1.7	2.8	14.7	0.4	129	10.6	0.4	2
21	0.5	0.4	0.7	1.1	4	4.4	25.8	0.7	128	20.1	0.8	2.3
22	0.6	0.5	0.6	1.4	4.4	•	•	•	•	15	1.1	1

Vessel	P Length	P Width	P Depth	P Space	P DBL	S Height	S Diam	S. Thick	S Angle	Neck Diam	Neck Thick	Block Prov.
23	0.6	0.4	0.5	0.8	3	•	•	•	•	•	•	3
24	0.7	0.5	0.5	2.1	3.4	•	•	•	•	•	•	Surface
25	0.7	0.6	0.4	2.1	2.1	•	•	•	•	10.9	0.6	2.1
26	0.5	0.5	0.4	2	2.7	•	•	•	•	18.6	1	10
27	0.5	0.5	0.4	1.4	1.7	•	•	•	•	11.7	0.8	2.3
28	0.3	0.3	0.3	0.6	0.7	•	10.5	•	•	•	•	2.1
29	0.6	0.5	0.6	2	2.5	6.6	27.3	0.7	117	20.5	0.8	10
30	•	•	•	•	•	•	•	•	•	•	•	Surface
31	0.5	0.4	0.6	2.1	3	•	•	•	•	•	0.7	2
32	0.4	0.4	0.7	1.9	2.7	•	•	•	•	•	0.7	2.1
33	0.5	0.5	0.5	1.5	3.4	•	•	•	•	•	•	Surface
34	•	•	•	•	•	•	•	•	•	11.4	0.7	2.3
35	0.7	0.3	0.7	1.4	3.6	•	•	•	•	•	•	RS
36	0.4	0.5	0.6	•	2.2	•	•	•	•	•	•	2.3
37	0.4	0.3	0.5	1.2	2	3.2	15.9	0.5	120	12.1	0.5	2.3
38	0.3	0.3	0.3	0.9	1.3	•	•	•	•	9.2	0.5	2.2
39	0.5	0.4	0.5	1.5	2.3	•	•	•	•	18.9	0.8	2.2
40	0.4	0.4	0.5	1.5	2	•	11	0.4	•	8.9	0.6	2.2
41	0.3	0.3	0.4	0.9	2.3	3	13.2	0.7	122	9.7	0.5	2.2
42	0.6	0.5	0.5	1.4	3.3	•	•	0.6	•	•	0.6	2.2
43	0.5	0.5	0.5	1.6	3.6	•	•	•	•	9.7	0.5	2.2
44	0.2	0.2	0.6	0.9	0.8	4	19.7	0.6	134	12.2	0.7	2.2

Vessel	P Length	P Width	P Depth	P Space	P DBL	S Height	S Diam	S. Thick	S Angle	Neck Diam	Neck Thick	Block Prov.
45	0.5	0.5	0.5	1.5	3	•	•	•	•	23.6	0.8	2.2
46	•	•	•	1.5	3.6	•	•	•	•	•	•	2
47	•	•	•	•	•	•	•	•	•	•	•	Surface
48	•	•	•	•	2.8	•	•	•	•	•	•	1
49	•	•	•	•	4.5	•	•	•	•	•	•	*2.2
50	•	•	0.8	•	2.8	•	•	•	•	•	•	Surface
51	•	•	•	•	•	•	•	•	•	•	0.5	2.1
52	0.5	0.4	0.4	1.4	1.6	•	•	•	•	11.7	0.5	*2.1
53	•	•	•	•	1.4	•	•	•	•	•	•	Surface
54	•	•	•	1.1	2.9	•	•	•	•	•	•	Surface
55	•	•	•	•	3.7	•	•	•	•	•	•	Surface
56	0.6	0.6	0.8	1.7	3.8	•	•	•	•	•	•	5
57	0.7	0.6	0.8	1.9	2.7	•	•	•	•	27.8	•	5
58	•	•	•	•	•	•	•	•	•	•	•	2
59	•	•	•	•	•	•	•	•	•	•	•	Surface
60	•	•	•	•	•	•	•	•	•	•	•	Surface
61	•	•	•	•	•	•	•	•	•	•	•	2.2
62	•	•	•	•	•	•	•	•	•	•	•	2.2
63	•	•	•	1.7	2	•	•	•	•	•	•	12
65	0.4	0.4	0.5	•	1.7	•	•	•	•	•	•	1
66	•	•	•	1.7	2.3	•	•	•	•	•	•	1
67	•	•	•	•	•	•	•	•	•	•	•	Surface

Vessel	P Length	P Width	P Depth	P Space	P DBL	S Height	S Diam	S. Thick	S Angle	Neck Diam	Neck Thick	Block Prov.
68	0.5	0.3	0.4	•	2	•	•	•	•	•	•	Surface
69	•	•	•	•	•	•	•	•	•	•	•	Surface
70	•	•	•	•	•	•	•	•	•	•	•	Surface
71	•	•	•	•	2.1	•	•	•	•	•	•	Surface
72	0.4	0.4	0.4	1.2	2.1	•	•	•	•	•	•	RS
73	0.9	0.8	0.4	1.5	2	•	•	•	•	17.5	1.1	RS
74	0.3	0.3	0.5	1.1	2.3	•	•	•	•	14.4	0.5	RS
75	0.4	0.4	0.7	1.3	3.3	•	•	•	•	17.4	0.7	RS
76	0.3	0.3	0.4	1.6	1.7	•	•	•	•	17.3	0.5	RS
77	0.3	0.3	0.7	1	1.1	•	•	•	•	16	0.8	RS
78	0.6	0.5	0.5	1.5	2.2	•	•	•	•	17.8	0.7	RS
80	0.6	0.6	0.5	1.6	1.7	•	•	•	•	•	•	RS
81	0.5	0.5	0.7	1.5	2	•	•	•	•	•	0.8	RS
82	0.7	0.5	0.6	1.8	3.7	•	•	0.6	•	13.9	0.7	RS
83	•	•	•	2	1.6	•	•	•	•	•	•	RS
84	0.3	0.3	0.3	•	•	•	•	•	•	•	•	RS
86	0.6	0.6	0.7	•	1.3	•	•	•	•	•	•	RS
87	0.4	0.4	0.4	1	0.9	•	•	•	•	•	0.8	RS
88	0.4	0.4	0.5	1.1	1.6	•	•	•	•	•	•	RS
89	•	•	•	•	•	•	•	•	•	•	•	RS
90	•	•	•	•	•	•	•	•	•	•	•	RS
91	0.5	0.5	0.6	2	3.2	•	•	•	•	•	•	RS

Vessel	P Length	P Width	P Depth	P Space	P DBL	S Height	S Diam	S. Thick	S Angle	Neck Diam	Neck Thick	Block Prov.
92	0.9	0.4	0.5	1.5	2.2	•	•	•	•	19.4	1.1	8
93	•	•	•	•	•	•	•	•	•	•	•	8
94	•	•	•	•	•	•	•	•	•	•	•	8
95	0.4	0.4	0.6	1.1	2.3	•	•	•	•	•	•	Surface
96	0.6	0.3	0.3	0.9	1.1	•	•	•	•	•	•	Surface
97	•	•	•	1.1	2.1	•	•	•	•	•	•	Surface
98	•	•	•	•	2.2	•	•	•	•	•	•	Surface